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THE EDUCATION OF IMPERIAL JAPANESE NAVAL OFFICERS OF THE EXECUTIVE BRANCH.

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Thursday, 25th February, 1904.

Admiral the Hon. Sir E. R. FREMANTLE, G.C.B., C.M.G. (Rear-Admiral of the United Kingdom), in the Chair.

I FEEL that I ought to offer some apology to my distinguished audience for asking them to listen to a lecture delivered in what, to me, is not only a foreign, but a very difficult language, and I would like your kind indulgence for any slight slip I may make in pronunciation during the course of the lecture.

For the sake of convenience I will divide the subject into the following sections:—

1. Entrance of cadets and their education in the Imperial Naval College at Yetajima.
2. Education of midshipmen.
3. Education of sub-lieutenants and lieutenants in their respective duties afloat and ashore.
4. Education of officers in the Imperial and higher Naval College at Tokio.
5. Education of officers in the Imperial Torpedo and Gunnery Schools at Yokosuka.

I.—ENTRANCE OF CADETS AND THEIR EDUCATION IN THE IMPERIAL NAVAL COLLEGE AT YETAJIMA.

1. This is open to every native male subject (with exceptions referred to in the following paragraphs) between 16 and 20, the whole

expense of training, and of food, clothing, etc., being provided out of Government funds.

2. The following are not allowed to enter:—

- a. If married.
- b. If having undergone any grave punishment, or confinement.
- c. If declared bankrupt, and not having previously to entrance paid his debts in full; or if the successor of any such bankrupt, under similar conditions as to full payment of his predecessor's debts.

3. Applicants for permission to present themselves for the entrance examinations must forward their request between certain specified dates, which are published once a year in the Official Gazette, together with the full particulars as to the precise nature of the current examination—such varying, sometimes, slightly from those of preceding years. As. for instance:—

1. The entrance examination is divided into two stages:—
 - a. Physical.
 - b. Educational.
2. Anyone who fails to pass the physical examination successfully is not entitled to be examined educationally.
3. The outline of the educational examination is as follows:—

Mathematics	{	Arithmetic.
		Algebra.
		Plane Geometry.
		„ Trigonometry.
Japanese	{	Explanation of Literature.
		Composition.
English	{	Grammar.
		Translation of Japanese into English.
		„ English into Japanese (such as
		Macaulay's Essays, Irving's Sketch Book,
		etc.
Physics.		
Chemistry.		
History.		
Geography.		
Physical Geography; and		
Hand Sketching and Mechanical Drawing.		

N.B.—a. Graduates of specially authorised schools, where education is supposed to be more thoroughly performed than in others, are exempted from examination in physics, chemistry, geography, physical geography, and sketching, and mechanical drawing.

b. The French, German, and Russian languages are optional subjects, which may be taken up by students, the marks awarded for which will count towards the order in which the students pass into the college at the final examination, it being understood that a necessary standard must be reached in every subject of the obligatory course.

The foregoing formed the subjects of the entrance examination as it took place last year, and the actual results were as follows:—

Number of applicants	1,995
" " who passed the physical examination	1,400
Number of candidates who passed the qualifying examination in all respects, about	400
From whom the actual number of candidates selected to enter the college was	180

4. No Cadet, once entered, is allowed to change his mind, but must continue his studies at the college.

5. On discovery of the following disqualifications, any Cadet will not be allowed to continue his studies at the college:—

- a. Anyone who has not sufficient capacity to perform the duties of an officer.
- b. Anyone whose conduct is not good, or who is lazy, and does not improve in his conduct or assiduity after having *been warned*.
- c. Anyone, the result of whose examination is indifferent, and tends to show that he will be unable to pass the final examination successfully.
- d. Anyone who has received an injury, or who has suffered from sickness, and it is supposed will be unable to recover so as to serve efficiently as an officer.

6. The duration of the course in the college is three years, but should necessity arise—as in the case of war—it can be shortened.

The whole course is divided into three classes, and each course begins on 10th January and ends on 9th January in the year following.

The summer vacation begins on 21st July, and ends on 10th September, and the winter vacation begins on 21st December and ends on 9th January the next year, but if necessary the vacations can be shortened.

NOTE.—It is invariably the custom to devote a certain portion of the vacation to the practical study of sea duties on board the tenders attached to the service of the college.

7. The outlines of the course are shown in the following table.

TABLE SHOWING THE SUBJECTS AND TIME DEVOTED TO EACH DURING THE COURSES.

1st Year.

Gunnery (Infantry Arms, Field Guns, Naval Guns)	4 hours per week.
Seamanship	4 " "
Engineering	1 hour "
English	7 hours "
Physics and Chemistry	5.5 " "
Mathematics (geometry plane trigonometry, higher algebra)	6.5 " "
Making a total of 28 hours' study per week.	

2nd Year.

Gunnery (Field Tactics, Naval Guns, Ammunition)	4 hours per week.
Seamanship	3 " "
Torpedo	1 hour "
Navigation	3 hours "
Engineering	3 " "
English	6 " "
Physics	3 " "
Mathematics (spherical trigonometry, conic sections, differential and integral calculus)	5 " "
Making a total of 28 hours per week.	

3rd Year.

Gunnery (Ammunition, Properties of Trajectory, Theory of Firing, Judging Distance)	3 hours per week.
Seamanship	4 " "
Torpedo	4 " "
Navigation	7 " "
Engineering	1 hour "
English	6 hours "
Mechanics, statics, etc.	3 " "
Making a total of 28 hours per week.	

N.B. i.—Study of (1) "The International Rule of the Road at Sea." (2) Signalling. (3) Shipbuilding. (4) Preservation of ships and their gear, provision, etc., and many kindred matters are included in the course of seamanship.

ii. Study of meteorological observation, surveying, etc., is included in the course of navigation.

iii. Besides the above-mentioned, elementary courses of international and civil laws and naval history are provided.

iv. Every afternoon, after the regular course lessons are over, one of the following exercises takes place:—

- a. General battery drill.
- b. General infantry or field gun drill.
- c. General boat drill.
- d. Single-stick practice.
- e. Judo (a special kind of wrestling).
- f. Swimming.

8. When the Cadets pass the final examination, they are promoted to Midshipmen and sent to the special training ships.

II.—EDUCATION OF MIDSHIPMEN.

1. This is divided into the two following stages:—

- a. Education in the special training ships.
- b. Education in the ships of the standing fleet.

a. Education in the Special Training Ships.

The duration of the course and the details of study are not invariable; but, briefly speaking, the object of this course is (1) to

teach the Midshipmen how to apply practically what they have been taught in the college; and (2) to give them the foundation of the necessary experience how to perform their duties as junior officers. Generally, therefore, the instructors (all of whom are naval officers) who have been in charge of them at the college continue their instruction and training at sea.

At present the "Matsushima," the "Itsukushima," and the "Hashidate," all sister ships of 4,200 tons, and having modern armaments, machinery, fittings, etc., are employed for that purpose. I do not know whether the same arrangement will prevail as last year; but as that arrangement is supposed to be very satisfactory, as I am informed, I will briefly refer to it.

These three ships formed a squadron, under a rear-admiral, and cruised in home and foreign waters for about eight months, carrying out practical training. During the cruise the Admiral transferred his flag several times to each ship, so as to teach the midshipmen respectively borne the duties in flag-ships as well as in ordinary vessels of war.

After the course is completed, the Midshipmen are distributed amongst the ships in commission—almost invariably to the ships of the standing fleet.

b. Education in the Ships of the Standing Fleet.

There is no regular course, and they perform junior officers' duty under the supervision of the superior officers; but it is invariably a custom for the Captain of the ship to choose a most competent officer to take charge of them, besides giving orders to the gunnery, torpedo, and navigating officers to instruct them in their own technical branches.

III.—EDUCATION OF SUB-LIEUTENANTS AND LIEUTENANTS IN THEIR RESPECTIVE DUTIES AFLOAT AND ASHORE.

1. This is divided into two parts:—

- a. Practical.*
- b. Theoretical.*

a. Practical Education.

2. Captains have to superintend the instruction of officers under them, to encourage them, and make every effort to educate them in the duties of their professions. The following are the outlines of the methods of the practical education:—

1. To perform all duties diligently, and gain experience therefrom.
2. To impress upon them the obligations of the superior ranks, and give them experience to qualify them to fill the same in due course.
3. To become thoroughly acquainted with all orders, regulations, etc.
4. To make reports, according to the Imperial Naval Intelligence Regulations, and thus to train their capacity for observation and judgment. To facilitate the above, every opportunity is afforded them of seeing the various types of ships, visiting the naval establishments, forts, strategical points, manufacturing centres, etc.

5. To encourage them to be careful in the performance of all general duties on board, especially when at manœuvres, tactical exercises, gun and torpedo firing, training of men, etc., are taking place; the Captain is to assemble them and explain whatever points he may think necessary, or depute any other responsible officer to do so for him.
 6. To encourage them to add to their knowledge and experience by directing them to study how to carry out any defined duties if emergency should arise, such as is the case when at manœuvres or exercises.
 7. To control and revise, if necessary, the opinions given in writing their service remarks books.
3. At the end of about two months, from the date of appointment of Sub-Lieutenant to his ship, the Captain has to examine him in the knowledge of the duties in respect of ships' stations, regulations, important matters, such as fire-engine pipe arrangements, ammunition supply, turret gun mechanism, etc.

b. Theoretical Education.

1. This branch of education is intended to cultivate the knowledge and intelligence of officers by impressing on them the study of military matters during such times as they are not engaged on official duties.

The means to this end is not strictly defined, being dependent on the captain; but the following is the invariable practice:—

- a.* Essay.
- b.* Lecture.

a. Essay.

2. The Captain sets each officer a subject for "Yearly Essay," either theoretical or practical questions on military matters, and on this he has to prepare an essay. This may be done either yearly or occasionally.

3. The subject set varies according to the officer's rank, special duty, and capacity; and that for a junior officer is necessarily a practical and not a theoretical one.

4. Every officer has, further, the option of writing an essay on any subject selected by himself in addition to the one above referred to, which is compulsory.

5. The Captain returns the essays to the officer concerned after minutely examining and criticising the same.

6. In such cases as, in the Captain's opinion, the essay shows great ability, he may forward it to the Commander-in-Chief, accompanied by his criticisms thereon.

The Commander-in-Chief, in his turn, examines the essays presented by the Captains under his orders, criticises them, and those which he considers merit approval he presents to the Minister of Marine, returning the remainder to the officers who wrote them, through their captains.

7. When the Commander-in-Chief thinks it necessary or desirable, he may set subjects to the whole or a part of the officers under him, and direct them to write essays thereon. These are called "Occasional Essays."

8. The method of procedure in regard to Occasional Essays is similar to that of the Yearly Essays, except that the Captains do not examine or criticise them.

9. The Minister of Marine selects certain officers and directs them to examine thoroughly the essays presented to him by the Commanders-in-Chief, and select a certain number of the best of them, and when this has been done he issues "Certificates of Merit" to the officers whose essays have been so selected.

10. The Admiral at the head of the Education Bureau has these selected essays (together with all that have been presented to the Minister of Marine) printed and collected into a book called "The Annual Report of Essays," and this book is distributed throughout the fleets, naval barracks, etc.

b. Lecture.

11. It is almost universal for the Captains to nominate the lecturer and name the subject; but when an officer wishes to lecture on some particular question in which he is interested, or has special knowledge, he may apply to the Captain for his permission to do so.

12. The Commander-in-Chief will occasionally nominate the lecturer for any special subject.

13. The lectures are mainly set on some of the following subjects:

- a. What the lecturer has seen or has experienced when deputed to deal with any special matter.
- b. Performance of the duty which he was directed to carry out.
- c. Study of any subject in which he has passed, or experiments which he has seen, in the Higher Naval College, the Gunnery or the Torpedo Schools, etc.
- d. What special subject he has investigated, or in which he has obtained special experience.

IV.—EDUCATION OF OFFICERS IN THE HIGHER NAVAL COLLEGE AT TOKIO.

1. There are four different courses in the college, which are called (A) "Koshu," (B) "Otsushu," (C) "Senka," and (D) "Koshiuka" respectively.

2. The course (A) is provided for selected Lieutenants to be educated in higher military matters, so as to enable them to serve in important positions, or to give them a solid foundation for acting as higher officers.

3. The students in course (A) are selected in the following manner:—

- a. Commanders-in-Chief nominate such officers as are physically robust; as have excelled in the performance of their duties; of high courage; prompt and reliable in judgment; and whose capacity is deemed likely to develop further on.
- b. The President of the College examines the above officers. The examination generally consists of writing essays and the study of foreign languages; and on the officers successfully passing the college in these respects they further undergo a *viva voce* examination by a committee of higher naval officers which is specially nominated.

c. This committee deals with the officers' mental, practical, and educational capacities, and awards them their order of merit, which guides the Minister of Marine in making subsequent appointments.

4. The length of the course (A) is two years, and the subjects of it are as follows:—

Strategy (Naval and Military).
Tactics (Naval and Military).
Naval History.
Fortification.
Laws of the Country.
International Laws and Diplomatic History.
Military Administration.
Political Economy.
Gunnery, Torpedo, Navigation, Shipbuilding, and Engineering Courses.
Higher Education of the general course.

N.B.—During their course of study, the officers undergoing instruction are frequently sent to attend or take part in various manœuvres, and to visit ships, forts, naval stations, manufacturing establishments, etc.

5. The course (B) is provided for lieutenants to give them higher education in either Gunnery, Torpedo, or Navigation duties.

6. The entrance examination generally consists of mathematics and foreign languages, and is open to competition, and a selected number of officers who satisfactorily pass this entrance examination (and who are deemed to be competent to serve as specialists in the subjects they enter for) are finally allowed to attend the course.

7. The length of course (B) is one year, and the successful candidates are educated in the following subjects, besides their own special courses (higher courses of Gunnery, Torpedo, or Navigation):—

Gunnery.

Naval Tactics
Shore Surveying.
Fortification.
Shipbuilding.
Higher Education of the General Course.

Torpedo.

Naval Tactics.
Surveying (Shore and Sea).
Shipbuilding.
Higher Education of the General Course.

Navigation.

Naval Tactics.
Surveying (Shore and Sea).
Shipbuilding.
Higher Education of the General Course.

N.B.—a. During the time of their study, they are invariably sent to attend or take part in various manœuvres, and to visit ships, forts, naval stations, manufacturing establishments, etc. b. Officers who have studied Gunnery or Torpedo matters, after finishing their

theoretical studies in the college are subsequently sent to the special Gunnery or Torpedo Schools respectively for practical experience for about three months.

8. The course (C) is provided for Captains, Commanders, and senior Lieutenants to study any subjects they may themselves select, and their entrance is permitted if they are considered competent to effectively benefit by admission, and provided their proposed subjects coincide with Service necessities.

9. The subjects taken up during the course (C) are quite at the option of the students, and the length of time requisite varies according to the subjects so selected.

10. The course (D) is not a regular one, but when time permits, and their services are available, a number of officers may be summoned from various parts to take part in certain special matters, such as naval strategy, naval tactics, etc.; the length of time devoted is generally short—from two to four weeks, for instance.

V.—EDUCATION OF OFFICERS IN THE IMPERIAL NAVAL GUNNERY AND TORPEDO SCHOOLS.

1. These courses are provided for Captains, Commanders, and Lieutenants who have just passed the theoretical Gunnery and Torpedo course in the Higher Naval College; and for Sub-Lieutenants, to afford them further practical training.

2. The entrance of Captains and Commanders is sanctioned by the Minister of Marine, provided their applications to attend are approved by him; but when their services can be spared, it is eventually intended for every Sub-Lieutenant to be directed to attend either (or both) the Gunnery and Torpedo Schools for a course of study.

3. The courses and the duration of time vary from time to time.

4. Besides the above-mentioned, in such cases as, for instance, when some new weapons have been introduced, or some new scientific discovery made, or drills have undergone changes, a number of officers are summoned from various parts to bring themselves up-to-date in such matters, and to teach their comrades or those under their command what they have themselves just acquired.

I have to thank you, Gentlemen, for giving me your kind attention. I think, from the details I have given, it will be admitted that my country has followed pretty closely in the footsteps of the "Mistress of the Seas"; whether in one or two small particulars we may perhaps have gone "one better," it will be for you to decide. In conclusion, permit me to thank the Council for the great honour they have done me, a foreigner, though a guest of England, for the opportunity they have afforded me of showing to an English audience of experts the progress in naval education reached by us.

Admiral Sir NATHANIEL BOWDEN-SMITH, K.C.B. :—I think we must all agree that we have listened to a paper of great interest. There are one or two questions I should like to put to the lecturer, if he will allow me to do so. He says, with regard to the entrance of the naval cadets, that "no cadet, once entered, is allowed to change his mind, but must continue his studies at the college"; and three sentences further on he says that if any cadet is lazy or wanting in assiduity, after having been warned, he will not be allowed to remain. Considering the number of

cadets has been whittled down from 1,995 to 180, is it found necessary to discharge many of those lads after they have once joined the college? I am somewhat surprised to see that in the list of subjects taught during their three years' course, the study of English occupies a greater number of hours than any other subject. They give nineteen hours a week to the study of English during the three years, which is a higher number of hours than is given to any other subject. We can hardly flatter ourselves that it is because of any great regard for the British nation that so many hours are devoted to the study of our language; I presume it is because nearly all the charts and sailing directions, etc., are printed in English, and therefore it is necessary that officers should have a good command of that language. There is one other matter in connection with the curriculum that I should like to refer to. I notice that a very short time is given to what is called engineering—one hour a week in the first year, three hours a week in the second year, and one hour a week in the third year. I should be much obliged if the lecturer would tell us what instruction in engineering means. Does it mean that these lads are taught the use of ordinary tools, or in any way to be mechanics, or to work a lathe, or does it mean that they are simply instructed in the theory and knowledge of the steam engine by an engineer? I look upon that as rather an important point, and think that the English Navy has, in that respect, gone one better than the Japanese, if the training they give is merely theoretical. There is one passage of the paper which we in England might copy with advantage. The lecturer tells us that when any new weapon comes out, or any scientific discovery is made, or when there is any great change in any of the drills, a certain number of officers are summoned from various parts, and are brought together to witness the performance of this new weapon or projectile, so that when they have learned all about it they may go back and impart the information they have gained to the rest of their comrades. That appears a good idea. I remember visiting Nagasaki in 1857 as a midshipman, and at that time, so far as I can remember, one never saw a Japanese outside his own country. There were a certain number of small Japanese vessels which used to navigate round their own coasts; but I never remember seeing the Japanese flag outside their own country. Now this extraordinary nation has a well-developed Army and Navy; and a mercantile marine consisting of some three hundred steamers sailing under their own flag. It is the most extraordinary progress any nation has made in the same time during the history of the world, and I venture to congratulate the lecturer on the great advance his country has made.

Rear-Admiral J. INGLES :—I would like to pay my tribute of congratulation to the lecturer on his very interesting speech. I rather think he must have been one of my boys in the Imperial Naval Academy at Tokio; but I can see that he does not remember me. In regard to this very delightful paper on the naval education of Japanese officers, I have no doubt many people here may think that it is more like board school education than the education of a naval officer. We hear of arithmetic, algebra, and so on, *ad infinitum*. When I went to Japan, one of my principal duties there was to attend to the higher education of naval officers. I was warned by one man in England, who was deficient in naval education, that the Eastern nations were too bookish, and that I must be very careful to take them away from their books and teach them practice. He pursued the subject so much that I imagined the Japanese nation must be like those philosophers of Laputa, who are described in "Gulliver's Travels," who were so absorbed in mathematical problems that they had to have a man on

each side of them with a bladder full of peas to hit them on the ear to wake them up. But I did not at once proceed to take the Japanese away from their books. I waited patiently for three or four months, and I found that although they knew as much, or more, than our young naval officers knew about books, especially Euclid and algebra and applied sciences, they were good at the practical aspect which these things had to the handling of ships, and they never seemed to lose the spirit of the naval officer. I very distinctly remember seeing a row of cadets on the college ground at Tokio; they were very obedient, standing up like soldiers. They were being instructed in drill by an English instructor. A poisonous snake appeared on the ground in front of one of these youngsters. I shall never forget how he ran out to the front, evidently tired of the dullness of "drilling," got hold of this poisonous snake by the neck, held it up to his next companion, and between them they killed it. One of the cadets then pitched it over his shoulder; they both ran back to the ranks, and stood up again at attention. With regard to the Japanese nation, I do not wish to enter into generalities. The Japanese nation is, as far as I know, unique. Nothing that I have ever come across in any part of the world is the least like it. They combine every good qualification of the Eastern with every good qualification of the Western; they have the patience, the cleverness, and the cunning, used in its best sense, of the Eastern; combined with that they have the "shove" and "go" of the American who comes from San Francisco, or the Southern Frenchman or Italian. Nothing has been seen like it, as far as I know, in the modern world's history. I had occasion to speak a good deal on this subject when the Japanese began their war with China, and as that war went on all my prophecies were entirely verified. "Oh," said one of my friends to me, "but they are only fighting China. China is nothing; of course it will be a walk over. But wait till they meet a European nation." We have received some results of the latest war, and in every respect the Japanese have verified the old spirit of the Samurai. They are a fighting nation. If they have had to give up fighting in the old two-handed sword manner, they have adapted themselves in a most wonderful way to fighting with the modern rifle, the modern gun, and the modern ship. The Japanese naval officer not only knows how to learn; he knows how to obey. The social distinctions in Japan are very much in advance of those in England. Japan was a feudal nation down to 1869. The different classes of society are marked out in a very distinct manner, and every Japanese knows, as you may have seen from the little Japanese play which is going on at His Majesty's Theatre, how to bow to his superior officer. The old spirit of the Japanese Samurai still obtains; there is an entire deference to the superior rank without any pressure. There is no severe discipline in the Japanese Navy; the discipline is easy. They are also a law-abiding people. But I must not detain you on this fascinating subject. I love the Japanese, and I love to speak of them. When I begin to speak of the Japanese, I almost feel carried away. Our lecturer did not say much on the subject of how naval tactics were taught in the Imperial Naval Academy at Tokio; but I found them quite alive to the importance of that subject. They were all imbued with the old sailing history of England. Most of the boys had read a great many of our naval histories, and I can assure you that we patiently thought out many questions connected with old sailing-ship battles. After that we threw aside any of those formations which were of no use, and tried what we could make with the remainder, and how they could be adapted to the tactics of the steam vessels in modern times. I can assure you that the tactics in the

battle of the Yalu, as it was called, between the Japanese and the Chinese, which occurred two years after the lecture of which I have a remembrance, that the exact tactics of that battle were followed in every respect, although I have heard it said that the battle of the Yalu was a mere mass of confused ships, which went in pell-mell, and that the whole success was due to the entire demoralisation of the Chinese. We described how a fleet in line ahead could sail triumphantly along the front of a line abreast, and give them all the fire of the side guns, and especially destroy the signalling power of the enemy's admiral. I will not go into the details of the question; but in discussing it we thought that in a long line of ships passing along the front there might be two or three cut off in the rear—slow ships. And we discussed how those vessels were to move. The battle of the Yalu was an exact representation of that. There were two ships cut off in the Yalu, and they moved as they had been directed—that was right away into the fire and smoke. After having considered tactics so carefully as the Japanese did eleven years ago, if they have gone on since in the same direction, I feel convinced, as I did last night when I heard of the reported destruction of the Japanese Fleet at Port Arthur, that the Japanese would go right. Although, as my friend the lecturer said, they have learned many lessons from what he kindly called the "Mistress of the Seas," I feel that in the future we, in our Navy, will have a great deal to learn from the Japanese Navy; and as far as I know in this war they have, in the lecturer's own words, gone one better.

Fleet-Engineer W. J. HARDING, R.N. (Retired).—The final paragraph in this paper reminds me that in the year 1874, at the opening of the session of the Naval College at Tokio, His Majesty the Mikado attended, when an officer named Captain Sawa read a very able essay. His essay was on the battle of Trafalgar, and his closing words were to the effect that he had described this battle, which was the most momentous event in the history of England, and that from that time England might be said to have been the mistress of the seas; and his fervent hope was that the opening of the Naval College and the training of the naval officers in Japan would result in Japan becoming the England of the East. I think that late events have gone somewhat towards earning Japan that name. The Naval Mission in those days—in 1873—was under Commander (the present Vice-Admiral) Douglas. The training of the Japanese, which was apparently without routine, had hitherto been in the hands of several of their most talented officers, some of whom had been under training by Admiral Tracey's mission. One of our countrymen, long since dead, Lieutenant Hawes, R.M.L.I., worked well for the development of the Navy, in an advisory capacity, and Rear-Admiral Ingles also did very much towards later development. But in our days the Navy was composed of sailing-ships, so that the course was nothing like the course which has now been developed. In those days we took the youngsters, and I know that, at least, Admiral Douglas was very much afraid that they would not become pitch and tarry men; that they would not like to handle tar and such like things. In a very short time the youths were deep in the "Britannia" training; eventually they went on to the small-arm and cutlass drill; and later on a battery was built by the seaside, which soon showed that shooting straight was one of their fortes. Of course, we English people always respect those who can shoot straight; our own earlier naval history shows that. We found in the college a very excellent library. The majority of books in those days were in Dutch, and the foreign language most spoken was Dutch, and they learned

Dutch tactics; but there were many English books, and I found that many of the students were very great students of the English language. I shall not attempt to deal with the very long course of study which the naval officers have; the items are certainly widespread, and I daresay that each and every one of them is well studied. The youngsters that I taught were certainly good students; a few of them, perhaps, were backward in the pronunciation of English, which was a great task to them. But once they got over the letter "l" they went ahead. One of the best cadets I ever had could never overcome the letter "l," but he became a good officer all the same. When the youngsters had any difficulty with their books, they used to come to me and show me any passage which they thought hard, and those passages were always covered over with little pieces of red blotting-paper. I endeavoured to explain what the passage meant, and when the piece of blotting-paper was flicked away by the finger it showed me that they fully understood what I had attempted to explain. Like Rear-Admiral Ingles, I have a very strong admiration and love for the Japanese. When they are understood, I think they are good people. A nation which has been able to put a million of men under arms for ages past, and at ten minutes' notice to mobilise them with their swords by their sides, is a people to be respected and to be admired. I think recent events show that the strength which they previously had in the old Samurai spirit, which still remains, combined with the instruction that has been given them, has produced good results. I wish to express to Commander Sato the very great pleasure with which I regard the product of his brain, which I am sure will be of very great interest to many people, and to naval officers especially.

Mr. R. J. B. HOWARD (late Canadian Militia):—As a civilian I have no right to take part in a discussion of this kind, except to join in paying my compliments to the author of this paper. But as one who has taken an interest for some years in the question of naval education, there were one or two questions I desired to ask, but nearly all of them have been anticipated by the previous speakers. There is one, however, which remains, which was referred to, I think, by Rear-Admiral Ingles, namely, whether or not it is the case that during manœuvres, as part of the higher training, it is the habit in the Japanese Service—I prefer that word to Services—to place army officers on board ships, and to send naval officers to work in the batteries on shore, and so to combine, as far as possible, the two branches of the Service. All the other questions I intended to ask have been anticipated by previous speakers. In conclusion, I wish to say that I have had a good many fellow-students Japanese in the past (and I hope I shall have more in the future), and they were always good fellows.

The CHAIRMAN, (Admiral the Hon. Sir E. R. Fremantle, G.C.B., C.M.G., Rear-Admiral of the United Kingdom):—I am sure we all feel very grateful to Commander Sato for having given us all this information, which is of the greatest value to those who are interested in the question of naval education, about which we have heard so much during the last year or two. One thing has struck me very much with regard to the entrance examination, namely, that it is divided into two stages: (a) physical, (b) educational. I do not know what the physical examination exactly consists in, and I feel inclined to ask what the physical examination means. I asked what it consisted in in China, because the examination for the Army, at all events,

is entirely of a physical nature; and I was told that it consisted in firing from a bow and arrow on horseback and lifting heavy weights; but I do not know that that is precisely the examination as it is conducted in Japan. I presume the physical examination means that the candidates are strong and healthy.

Commander SATO:—Bodily fit.

The CHAIRMAN:—As we see from the paper, education is carried out very completely; in fact, I may say that the system in the Japanese Navy is a continuous system of education, and, to some extent, of examination. The same thing takes place more or less in the United States Navy. I do not know exactly how they carry it out, but I know they have an examination for an admiral in the United States Navy. One of their admirals came out to China while I was there, and he said to me: "I passed my examination for an admiral." I said: "In what does it consist?" and he replied: "Well, sir, it is mostly physical." I felt rather inclined to ask, as he was rather stout, whether he had to jump over a chair, or what; at all events, they do have a physical examination, which is, perhaps, a good thing; but it is a little difficult to know in what the physical examination consists. Then I should like to say a word about another subject. We have lately taken to entering boys very young. We know very well that they talk about the nursery at Osborne, where the boys are very young. I do not know that it is a good system; I hope it is. If they are to go in strongly for mechanics, it is a good thing to have them when they are young; but my own opinion is that it is a little too young. I would call your attention to the fact that in that particular respect the Japanese Navy has taken a leaf rather out of the American book than out of ours. I believe that in the American system the age of entry is any time between fifteen and twenty-one, and in the Japanese I notice it is from sixteen to twenty. That is a very different system to ours in that respect. I believe they can get a certain amount of education out of the private colleges and so on, whereas I think that one reason that influenced Lord Selborne to begin our education so young was that he said the public schools did not play up to us, and that we did not get the correct preliminary education out of the public schools that we wished to have. Then it seems to me that the training of young fellows in special training-ships is an exceedingly good system. I have always been in favour of special training-ships; I know they were discredited principally because trouble was not taken in former days to appoint the men really suited to command, and perhaps because it was nobody's child, to some extent. At all events, I think the system was not sufficiently encouraged. They have carried that out very thoroughly in Japan, where they seem to be very thorough in doing everything. It is certainly a very good plan to have three ships under an admiral, and for the admiral to change his flag, so that the men can really find out what the work on board a flag-ship is; whereas, as we know perfectly well in our own Service, young fellows very often serve for a great number of years who have not an opportunity of serving on a flag-ship, and somehow or other they are a little adrift when they do happen to join the flag. Another thing is, that I think we sometimes make a mistake in making our admirals a sort of great Bashaw. No doubt an admiral is a very great man; I ought to know that. Sometimes we cannot employ a great many admirals, because they must have such a great staff, and because they must receive so much consideration, and because the admiral is not to show himself too often,

and all that sort of thing. They do not do that. They use an admiral as if he was a man who was accustomed to do work, and to see that other people do their work, and I venture to think that, after all, that is the right principle. There is another question on which I think they go one better than we do. I do not know exactly how it is at this particular moment—it certainly was so when I was out in China a few years ago—but I know that, generally speaking, the naval officer is treated in this way: Supposing he wants to go over a fort; the general or officer in command makes a lot of trouble, and almost makes a personal favour of it. I cannot say I have ever been refused permission to go over any fort; but I do recollect that when I was at Mauritius they made a great favour of it. I do not know what they didn't do. They said they did not know whether they could grant permission without telegraphing home; but as there was no telegraph, I pointed out they could not do it, and eventually I was allowed to go over. But with the Japanese Navy it is part of the curriculum. The naval officers visit the forts, and go over them; and I venture to think it is quite right too that naval officers should not be kept in the dark as to what the armaments of particular forts consist in. It is sometimes considered by the military that we should know nothing about the forts, because, forsooth, we might tell somebody else! That is a subject on which I think some improvement should be brought about if possible. With regard to the system of instruction and examination, I think that it is exceedingly good, if it is not carried too far to the detriment of executive work. The same remark also applies to the essays, of which the lecturer has spoken. There is one other thing I wanted to make a remark on. There are many things we learn from the Japanese Navy. They have some advantages over us. Every new Navy has this advantage: that it has no traditions. All traditions are exceedingly good, if they are taken in the right way. There is some little modicum of truth even in what Mr. Jane said when he stated that there was too much Nelson nowadays. His idea was that some people look back and only think of what has taken place in years gone by, and do not keep up-to-date. In the Japanese Navy they are very anxious to keep up-to-date, and we have seen lately that they practically do keep up-to-date. We have seen, from their recent actions in "the real thing," that they know what the duties of naval officers are, and that they are prepared to carry them out. There is no half-pay in Japan. I think they have been wise in that respect in not copying us; I think they are wise in keeping their officers constantly employed, and that the old idea that a man ought to be put on half-pay for a considerable portion of his life is quite impossible at the present day. I do not wish to detain you any longer; but at the conclusion of his lecture the lecturer said that he considered it a great honour to come here and be allowed to give us this lecture. I can assure him that the honour is all on our side. We know that great attention has been paid by the Japanese to their system of education; we know they have had instruction from some of our best officers, and I am proud to think that Rear-Admiral Ingles, who was the last of them, and who gave them such very good instruction, is here. But while I have no doubt they have learned a great deal from us, is it not right that we shall endeavour also to learn a great deal from them? They had the advantage of starting without prejudice, as it were. They have adopted our system to a very great extent, mainly our system, I think; and that an officer of their Navy, one who is held in very high esteem in the Japanese Navy, should come here and give us the full information he has in regard to the system which they

adopt in their education is, I consider, a great honour to this Institution, and we are all very much obliged to him. I am suré I shall be carrying out the wishes of all those present when I tell him that we are sincerely pleased with his lecture, and that we shall appreciate it still more when we see it in the JOURNAL. Lieut.-Commander Sato tells me that he starts for Japan in two or three days. Such a first-class officer is not likely to be allowed to remain in this country when he is so much required in the other part of the world, and I am sure we all desire to wish him a very pleasant voyage.

THE VON LÖBELL ANNUAL REPORTS ON THE CHANGES AND PROGRESS IN MILITARY MATTERS IN 1903.

Précis from the German by LIEUT.-COLONEL E. GUNTER, *p.s.c.*,
(late) East Lancashire Regiment.

PREFACE.

THIS Publication is issued rather earlier than usual, but, notwithstanding this, the latest details available as regards Russia, Bulgaria, and Turkey are included.

Besides the Reports on the Armies of European States, accounts are given of those of Japan, Korea, the United States, Mexico, and Chili.

That of Japan is partly from the pen of Lieut.-General von Janson, who, during a residence of many continuous months in Japan, had good opportunities for observing this Army, and partly from the Kosima Military Association of Officers in Tokio. This is not quite in accordance with the general character of this work, but is otherwise of interest.

Last year's volume, the XXIX., included a report on the principles of Transport, Train, etc. It had been intended to include in the present volume a Report on the Train and Transport systems of the individual States. This had, however, to be postponed till next year. In place of this a Report on the present state of War Balloons is introduced, which, owing to the great progress made in France in this branch of the Military Service, and to the exhibits shown by different nations at St. Louis this year, will, it is hoped, prove of especial interest. The Chapter on Coast Defence which has been added will also, it is trusted, merit attention as bearing upon the War in the Far East.

(Signed) VON PELET-NARBONNE,
Lieut.-General.

March, 1904.

PART I. ORGANISATION, ETC. FRANCE.

France is on the verge of reducing the period of compulsory service to two years, says the Report.†

† Since this was printed, the decree introducing two years' service has been passed.—E.G.

A new edition of "Infantry Training" has been issued. Nothing is known as to the issue of a new rifle, but the ammunition has been altered.

The rearmament of the Field Artillery has been completed, but the Horse Artillery Battery of the Cavalry Divisions has not yet been supplied with a Q.F. gun with barrel recoil. The new provisional Regulations for Field Artillery Training have been finally approved.

The Cavalry has been divided into Heavy and Light Cavalry Divisions.

Efforts towards self-improvement are being made in the Army, but political exigencies are against it, as it has no undisputed authority as its head.

The French Army is now divided in war into Army Corps and Cavalry Divisions. Several Army Corps form an "Army." Several Armies operating conjointly together form an "Army Group." Cavalry Divisions may be formed into Cavalry Corps.

An Infantry Division consists of 2 Infantry Brigades of 2 Regiments, each of 3 or 4 Battalions; 1 Squadron Cavalry; 1 Regiment of Field Artillery of 2 Artillery Brigades, of 3 Batteries each; a company of Field Engineers; and a Sanitary Detachment.

An Army Corps consists of 2 Infantry Divisions (except the VIth and VIIth Army Corps and the Colonial Corps, which have 3 Divisions);

1 Corps Cavalry Brigade of 2 Regiments (the VIth and VIIth Cavalry Corps have 3 Regiments); and a Cavalry Sanitary Detachment (Bearer Company);

1 Corps Artillery Regiment of 3 Field Artillery Brigades of 3 Batteries each, and 1 Horse Artillery Brigade of 2 Batteries;

1 Engineer Company with 1 Corps Field Park and 1 Bridging Train;

1 Corps Telegraph Detachment;

1 Sanitary Detachment (Bearer Company);

1 Corps Ammunition Park in 8 Divisions (1st Division=4 Artillery Ammunition Sections; 2nd Division=2 Infantry Ammunition Sections; 3rd Division=2 Artillery Park Sections and 1 *matériel* Reserve Section);

8 Field Hospitals;

4 Provision Trains and 1 Corps Cattle Park;

1 Field Bakery;

1 Horse Remount Dépôt;

1 Clothing Reserve Park.

A Cavalry Division consists of 2 or 3 Cavalry Brigades, each of 2 or 3 Regiments; an Artillery Brigade of 2 Batteries; 1 Sanitary Detachment.

The Colonial Corps† consist of those troops of the Colonial Army (permanent staff, etc.) quartered in France. In the case of a Continental war they will join the Main Field Armies. It consists of 3 Divisions of 2 Brigades each, each Brigade of 2 Regiments of 3 Battalions each. Total, 36 Battalions. Also of 3 Artillery Regiments with a total of 8 Field Batteries, 18 Garrison, and 6 Mountain Batteries.

† A brief account of the French Colonial Army was given in the JOURNAL for October, 1902, p. 1295.—E.G.

The strength of the Units is as follows:—

	In Peace.					In War.			Remarks.
	Officers.	N.C.O.'s and Men.	Horses.	Guns.	Wagons.	Officers.	N.C.O.'s and Men.	Horses.	
Infantry Company	3	125	1	—	—	4	250	—	
" Battalion	14	502	6	—	—	—	—	—	
Rifle " (6 Companies)	33	818	10	—	—	—	—	—	
Cavalry Squadron	6	150	141	—	—	7	160	160	
Field Battery	5	103	61	4	2	4	170	168	Q F.F. Guns. The H.A. of Cav. Divns. have 6 guns per Batt., but not Quick- Firers.
H.A. "	5	105	87	4	2	4	170	210	
Garrison Battery	4	129	4	—	—	—	—	—	
Company Engineers	4	108	—	—	—	—	—	—	

These Peace strengths are not all reached, the Corps on the frontier being brought up to their establishments at the expense of those in the interior when short of men.

The total strength available for war has been variously estimated at between 2,000,000 and 3,000,000 men.

Dr. Aubœuf's estimate (Français et Allemands) is as under:—

1.—Active Army, including discharged men and Colonial Troops in France	784,000
2.—10 Classes of Reservists	1,897,000
3.—6 " Territorial Army	972,000
4.—6 " Reserve of the Army	854,000
	4,507,000
5.—Officers, inclusive of Gendarmes	49,000
The Fleet	119,000

The new law reducing the term of service to two years excludes one year volunteering even for the higher classes. If the breadwinner of a family is taken for service that family receives State support, and it is intended to enforce in the most rigid way the law of universal service for all, gentle or simple. The expense of the change in the law is reckoned from 30 to 40 million francs (£1,600,000).

RECRUITING, ETC.

In 1903 out of 325,013 men liable for service

22,041 " were found unfit.

302,972

Of these were
deducted—

For Naval Service	5,381
One year's Volunteers	63,551
Already joined "	26,074
Appointed to Auxiliary Services	13,661
Rejected bad characters	88
Abroad and excused service	683
Put back for subsequent service	42,372

151,810

Leaving .. 151,162 to be enrolled for service in the regular forces for 3 years.

To these were added those put back in previous years for future service. In the French Service, when a recruit has come up and has been passed fit and put back as above, it counts as service, so that, if put back for 1 year, he (under the 3 years' system) had only 2 years to serve; if for 2 years (under the 3 years' system) had only 1 year to serve.

The Recruits are called up by means of reply postcards, as are used for Reservists when they are called out.

The Report goes into voluminous interesting details of the conditions of service in France, and of the census, population, etc., which we have not space to reproduce.

In 1902 the births and deaths returns showed an increase in the former of 83,944 in a population of 39 millions, but that was exceptional.

TRAINING, MANŒUVRES, ETC., 1903.

General de Négrier conducted the Manœuvres of the XIIth and XIIIth Army Corps in the neighbourhood of Bourgneuf, in September, in which month also General Metzinger, the prospective Commander of the "Army of the Alps," superintended those of the XIVth and XVth Army Corps and VIth Cavalry Division in the country between Orange and Montélimar. General Poulléau, commanding the XVIIIth Army Corps, President of the Cavalry Commission, held Cavalry Manœuvres on a larger scale near Réthel in the beginning of September, the 4th and 5th Cavalry Divisions, the 2nd and 6th Corps Cavalry Brigades, 2 Detachments of Engineer Bicyclists, a Bicyclist Company, a Machine Gun Detachment, and an Infantry Brigade took part in these.

In most Army Corps, besides the above, Brigade and Divisional Manœuvres lasting several days were carried out.

In 1903 the following new Regulations were issued:—

- Manœuvres Regulations.
- Infantry Drill (finally approved).
- Field Service Regulations, 1903.
- Provisional Musketry Instruction for Cavalry, 1903.
- Field Artillery Training, 1903.
- Garrison " "
- Mountain " " (Provisional).
- Train and Transport Regulations, etc.

GERMANY.

No change has taken place in the peace organisation of the Forces of the German Empire. There are 22 Army Corps, of which 2 are Saxon (XII., XIX.), 1 Würtemberg (XIII.), 1 Baden (XIV.), and 3 Bavarian (I., II., III. Bav.). All have 2 Infantry Divisions, except the Ist and XIVth, which have 3 each. There is one permanent Cavalry Division of the Guard at Berlin. There are 17 Squadrons of Mounted Rifles (which differ but little from the ordinary Cavalry Squadrons, except that the men are lighter), of which 5 form one permanent Battalion with the Vth Corps at Posen, East Prussia.

The Peace Establishments are as follows†:—

	Number.	Officers.	N.C.O.'s and Men.	Horses.	Guns.	Wagons.	Remarks.
<i>Infantry Battalions.</i>							
Higher Establishment ...	90	22	640	—	—	—	
Lower " ...	517	22	570	—	—	—	
<i>Rifle Battalions.</i>							
Higher Establishment ...	4	22	679	—	—	—	
Lower " ...	14	22	615	—	—	—	
<i>Cavalry Squadrons.</i>							
Higher Establishment ...	60	5	145	139	—	—	
Lower " ...	405	4-5	138	135	—	—	
<i>Mounted Rifle Squadron ...</i>	17	5	135	—	—	—	
<i>Machine Gun Detachments</i>	15	4	77	54	6	2	
<i>Field Batteries ...</i>	12	4	127	76	6	2	
Higher Establishment ...	309	4	115	61	6	—	
<i>Horse Artillery Batteries.</i>							
Higher Establishment ...	22	5	121	120	6	2	
Lower " ...	20	4	92	76	4	—	
<i>Garrison Art. Batteries ...</i>	38	20	570	—	—	—	4 Cos.
<i>Field Engineers Battalion</i>	26	24	611	—	—	—	
<i>Bavarian Engineers Bn. ...</i>	1	13	337	—	—	—	

† These are given for comparison in view of the projected reduction in the establishments of British Battalions.—E.G.

GREAT BRITAIN.

The Report gives the numbers of the Forces of the British Empire according to the Estimates for 1903-4. It praises the efforts of Mr. Brodrick to organise 3 Army Corps for foreign service and 3 for home, but says the flight was too high a one for him. Still, it recognises that he effected several useful reforms, and that the condition of the soldiers was much improved, but that the men not being forthcoming, and the expense being heavy, his great scheme failed. It then describes the advent of Mr. Arnold-Forster, and what it calls the "War Office Council," consisting of Lord Esher, Admiral Sir John Fisher, and Sir George S. Clarke, and tries to describe the changes made in 1903. Among other things, it says the increasing anxiety caused by the defects of our Army organisation and of the national defences increased the active energy of the Army League, which has now published the *National Service League*, to spread its aims and objects throughout the Kingdom. This is a natural mistake for a foreigner to make, for many of our own countrymen do not know the difference between the Army League and the National Service League, which are, however, two distinct organisations. The first aims at improving and furthering Army efficiency generally with-

out, however, pledging itself to any particular measure of reform, while the "*National Service League*" has for its definite object the compulsory military or naval training of every citizen not physically unfit, so that an efficient national Reserve for both Services may be formed on emergency.

The changes made in the reorganisation of the War Office, etc., in 1903 were, however, so many and sudden that a concise comprehensive account could not possibly be given in a Report dealing with so many subjects as von Löbel does, but copious extracts from the Report of the Inspector-General of Recruiting are given. It notices the changes in the educational staff, the camping out of the Woolwich and Sandhurst cadets, etc. It describes and condemns the case of "ragging,"† which attracted public notice for some time, strongly upholding Lord Roberts' action in the matter, and shows generally how very closely military matters in England are watched by our German comrades.

The addition of a Brigade of Field Artillery to the Infantry Divisions, and the reconstitution of our Corps Artillery are given, as well as that of the Ammunition Columns.

The Report says that the khaki clothing, which reminds the British Public of the important and at times critical campaign in South Africa, has now been definitely discarded.

JAPAN.*

The present Emperor of Japan is the 121st in an unbroken succession, which has lasted for 2,563 years.** Since 1100 A.D. the Army fell more or less into the power of the military leaders. Hence arose the feudal system which lasted actually until the year 1866. During the whole of this period the country was divided up into about 60 provinces, each under a Daimio, or Military Governor. Each of these kept up a little army of his own, composed mainly of cavalry and infantry. Their weapons were chiefly bows and arrows, lances and swords. They wore armour.

The present Emperor ascended the throne in 1867; he resumed full Imperial powers in the following year, and in 1870 the Daimios renounced their individual authority.

The Samurai or feudal troops were disbanded, the organisation was remodelled and perfected, a War Office was created, the French Military and the English Naval systems were respectively adopted, and the present *régime*, under which the Emperor is personally Commander-in-Chief of the Army and Navy, was permanently established.

† The condemnation of the highest military authority, of public opinion, and the fact that hideous indecent pictures depicting the occurrences referred to were recently exhibited in the shops in Germany, ought to prevent any possible recurrence of such acts.—E.G.

* This report is partly from an account supplied by the Japanese Officers' Military Society, in Tokio, and partly from the pen of Lieut.-General von Janson, who, for many months, resided in Japan.

** General von Janson explains that much of this unbroken succession, which is officially recorded, is necessarily traditional. Where the succession failed, it was usual to adopt an heir.

In 1875 Universal Service was introduced, and in 1876 the whole country was divided into 6 Military Districts, in each of which an Army Division, composed of the three arms of the Service, was located. Since 1885 the Japanese Army has, as is well known, taken the German organisation, training, and administration as its pattern. In 1894 it carried on a glorious and successful war against China for the preservation of peace in the Far East.

ORGANISATION AND STRENGTH.

The Japanese Army is at present organised in 1 Guard and 12 Line Divisions of Infantry. Each Division consists of 2 Brigades of Infantry, 1 Cavalry Regiment, 1 Field Artillery Regiment, 1 Battalion Engineers, 1 Battalion Train. Besides these there are 2 Cavalry Brigades and 2 Field Artillery Brigades.

There are at present 23 Batteries of Garrison Artillery stationed where required for coast defence (chiefly in the bays of Tokio, Osaka, etc.). On the island of Formosa, 2 Mixed Brigades are stationed for local defence. No Army Corps are formed, the Divisions commanded by Lieut.-Generals being under the direct orders of the Emperor. The composition of the Units is similar to those of the German Army.

ARMAMENT.

The Field Artillery comprises Field and Mountain Batteries. The quick-loading gun was constructed by Major-General Arisaka in 1898. Their working and rate of fire correspond with those of the German field gun M/96. The Infantry carry the 1897 rifle of 6.5mm. (.256-inch) calibre. The magazine resembles the Mannlicher, and contains 5 rounds. The Cavalry carry carbines and swords.

In Tokio and Osaka there are rifle and gun factories, where guns, rifles, and ammunition are made. Near Tokio there is a Government Clothing Factory.

HORSES.

Compared to those of European breed, the Japanese horse is smaller, but hardy and suitable for war purposes. There is a Head Remount Establishment in Tokio, with several branches and stud farms in all horse-breeding districts. By this means, and the introduction of European-bred sires, it is sought to improve their breed, and already signs of progress are visible.

There is also a large Horse-breeding Establishment belonging to the Emperor.

RECRUITING.

Every son of Japan from the age of 17 to that of 40 is liable to personal service. No exemptions or substitutes are allowed. The Divisions receive their contingents of recruits from their Districts, the Infantry from the Regimental Sub-District, the other arms from the Divisional District. The recruiting is carried out by the Regimental Sub-District Commander in conjunction with the civil authorities.

All arms serve 3 years with the Colours, 4 years in the Reserve, and 5 years in the Militia.

There are also 1 year Volunteers and 6 weeks' Active-Service Volunteers.

Approximate War Strength of the Army of Japan, 1903.†

No. of Divisions.	Peace Station.	Infantry.			Cavalry.			Field Artillery.				Mt'n Art.	Eng'nrs.		Trains.	
		Brig.	Regt.	Bn.	Brig.	Regt.	Sqdn.	Brig.	Regt.	Divn.	F. Batt.	Mount'n Batt.	Bn.	Co.	Bn.	Co.
Guard	Tokio ...	2	4	12	1 ¹	3	13	1 ²	4 ³	8	24	—	1 ⁴	—	1 ⁵	3
1st	Tokio ...	2	4	12	1 ¹	3	13	1	4	8	24	—	1	—	1	3
2nd	Sendai ...	2	4	12	—	1	3	—	1	2	6	—	1	—	1	—
3rd	Nagoya...	2	4	12	—	1	3	—	1	2	6	—	1	—	1	—
4th	Osaka ...	2	4	12	—	1	3	—	1	2	6	—	1	—	1	—
5th	Hiroshima ...	2	4	12	—	1	3	—	1	2	—	6	1	—	1	—
6th	Kumamoto ...	2	4	12	—	1	3	—	1	2	6	—	1	—	1	—
7th	Hokaido ...	2	4	12	—	1	3	—	1	3	6	3	1	—	1	—
8th	Hirosaki ...	2	4	12	—	1	3	—	1	2	—	6	1	—	1	—
9th	Kanasawa ...	2	4	12	—	1	3	—	1	2	6	—	1	—	1	—
10th	Himeji ...	2	4	12	—	1	3	—	1	2	6	—	1	—	1	—
11th	Shikoku ...	2	4	12	—	1	3	—	1	2	—	6	1	—	1	—
12th	Kiuschiu ...	2	4	12	—	1	3	—	1	2	—	6	1	—	1	—
	Garr. of Forts ⁶ ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Line of Commn. ⁷	—	—	—	—	—	—	—	—	—	—	—	1	3	1	3
	Troops, Res. Cav.	—	—	—	2	4	16	—	—	—	—	—	—	—	—	—
	Reserve Art. ...	—	—	—	—	—	—	2	6	12	36	—	—	—	—	—

¹ In War 1 Regiment = 3 Squadrons only is attached to each Division, 2 Cavalry Brigades being formed as shown below.

² In War 1 Regiment = 2 Divisions, 6 Field Batteries, is attached to each Division, and Reserve Brigades are formed as below.

³ 6 to 7 Ammunition Columns, i.e., 4 for Infantry, 2 or 3 for Artillery, form also part of each Division in War.

⁴ Each Battalion of Engineers with the Division has with it 1 or 2 Bridging Trains and a Telegraph Detachment.

⁵ 6 Field Hospitals and 1 Ambulance Detachment, 4 Supply Columns and 1 Remount Depot accompany each Division in the field.

⁶ 23 Battalions = 92 Companies.

⁷ 1 Battalion = 3 Companies are trained Railway Engineers.

It is understood that a Siege Train and Field Park are also organised.

In Formosa there are in addition 3 mixed Brigades (11 Battalions, 3 Squadrons, 3 Batteries Artillery and Police, besides Garrison Artillery). There were troops in Peking (4 Battalions, 1 Squadron) and Korea before the war.

There is a sort of Frontier Militia of Military Colonists in Hokaido.

STRENGTH OF UNITS.

Each Division has a War Strength of about 14,000 men, Infantry Battalions being about 950 strong, and Cavalry Squadrons having about 120 mounted men. The Field Batteries have 6 guns and 6 ammunition wagons.

† The difficulty of obtaining accurate information as to the strength of the Japanese forces will be appreciated from the reports of the present Russo-Japanese War.—E.G.

The total strength of the Field Army was reckoned in 1903 at about 200,000 men, including Train of the Regular Forces, which consisted of about 136,000 rifles, 6,600 sabres, and 702 field guns.

The Reserves were about half as strong, and the National Militia about the same strength. The *Erzatz*† was estimated at about 25,000 Infantry, 2,300 Cavalry, 2,600 Artillery, 1,600 Engineers, and 3,000 Army Service Corps.

The *Landsturm* consists of men who have completed their service, and of other men not enrolled between the ages of 17 and 40 who are capable of bearing arms.

Terms of Service.—All men serve for 3 years, except the 1 year Volunteers and certain 6 weeks' Active Service Reservists. 13,500 men out of the total are allowed to go *on furlough* after 2 years' service with the Colours. Service in the Regular Reserve lasts for 4 years, and in the *Landwehr* (Militia) for 5 years.

Distribution.—Each Division recruits in its own district, except the Guards, who are recruited from the whole country. The Infantry of the Guard are chosen not for their size, but are *corps d'élite* selected from the gentry or small landed proprietors. The other arms of the Guard Division are recruited from the large Military District of the 1st Division.

The General Staff.—The Marquis Oyama is the Chief of the General Staff, who has as his principal assistant Lieut.-General Baron Kodama, who was formerly War Minister, then successively Governor of Formosa and Minister of the Interior, and for a short time Minister for Education—proof of the confidence placed in him.

The General Staff.—As in Germany, there is the Great General Staff and the Divisional Staff, consisting of about 150 officers. The Chief of the Staff has under him the Topographical branch and the Medical Staff, as well as the Staff College. Most of the General Officers come from the Staff College. Many Staff Officers have been in France or in Germany. German is mostly spoken. An excellent impression is made by Japanese Staff Officers as regards intelligence, knowledge, and earnest zeal for further self-improvement. The General Staff carries out all operation and executive duties.

Inspection, etc.—The Emperor is Commander-in-Chief of the Army. No Army Corps or Armies are formed in peace time; but the Emperor entrusts the inspection of some of the Divisions each year to one of his Field-Marschals. For this, only 2 Aides-de-camp and 1 General Staff Officer accompany them. The cadres of complete Staffs for 3 Armies are, however, kept up even in peace time.

Educational and Training Establishments.—The Inspector-General of Military Education and Training has under him the Inspectors of Cavalry, Field and Garrison Artillery, Engineers, and Train. The Central and Provincial Cadet Colleges, the Combined School of Artillery and Military Engineering, the War School, the Boards of Examination for Commissions, the Infantry Instructional Battalion.

† The Japanese Army was, it will be remembered, remodelled entirely upon the system of the German Army by German officers, and owed its strategical and tactical instruction to the well-known Colonel von Meckel.
--E.G.

(with which is combined the School of Musketry), the Cavalry Riding School, the Field and Garrison Artillery Practice Schools, and the Telegraph Instructional Battalion are also under him.

A War Office and other authorities are immediately responsible to the Emperor, under whose presidency a War Office Council is formed. In addition there has also existed since 1900 a War Board or Committee of Defence, consisting of the Ministers of War and the Navy, the Chiefs of the General Staff of each, and of the Inspector-General of Education and Training.

Manufactories of War Matériel.—Japan is now to a great extent independent of Europe as regards armament. Wrought steel is still imported. Unbored steel barrels of rifles are obtained in Germany; breech-blocks for guns from Germany or France; a certain number of 15-cm. (5·9 inch) field howitzers were lately ordered in Germany. The small arms factory in Tokio and the gun factory in Osaka are carried on as in Europe, and leave little to be desired. In Tokio it is said they can turn out 600 rifles daily. There are factories for black and smokeless powder in work, and for harness, saddlery, etc.†

Recruiting.—Each Divisional District is divided up into 4 Infantry Regimental Districts for recruiting; the other arms recruit from the whole Divisional area. In one of the last few years, 539,000 recruits were examined, 188,000 (about one-third) chosen, about 108,000 put back for the time, and the rest discharged.

Remounts.—There is a remount and breeding establishment in Tokio, with several remount depôts and breeding studs affiliated to it. The Japanese horse is small but hardy. It is not suited for reconnaissance or for artillery draught. Great pains are being taken to improve the breed.

OFFICERS, ETC.

Officers and Non-Commissioned Officers.—Young officers enter the Regiments either on the nomination of the Regimental Commanders or as Ensigns from the Cadet College. A certain number of non-commissioned officers are in war promoted to commissions. The Cadet College in Tokio accommodates 600 cadets. In 1903, 540 were available; the course lasts 2 years, in the provincial cadet schools 3 years. Great stress is laid upon *physical training* (gymnastics, etc.) and upon modern languages: German, French, Russian, Chinese (English is only taught to Naval Cadets). The Ensigns are probationers, who have then to pass through a technical course in the War School at Tokio, which lasts a year. Promotion is Army, not Regimental. The Infantry Captains are not, as in Germany, mounted. A Reserve of Officers is formed of those who have retired to the active list, and of one year Volunteers who have at the end of their year passed the qualifying examination and have shown their efficiency during a 2 months' further service. They are then "selected" by the officers of the existing Reserve Battalion, etc. Only about 2,800 officers appear as yet to be available on the Reserve List, which is a very small proportion. The ages for retirement are:—Generals,

† Torpedoes have also been manufactured during the last few years at the great Naval Arsenal at Kure, where heavy quick-firing guns, armour-plating, etc., are made.—E.G.

65 years; Lieut.-Generals, 62 years; Major-Generals, 58 years; Colonels, 55 years; Lieut.-Colonels, 53 years; Majors, 50 years; Captains, 48 years; First Lieutenants and Lieutenants, 45. The non-commissioned officers are re-engaged men approved by their C.O.'s. This is a weak point as in other Armies; the supply is too small. Means are being taken to offer further inducements to them to re-engage.

There are 2 *Feld-Webel* in each company: one is the Company-Sergeant-Major, who supervises all the field training under the officers; the other is a sort of accountant, who looks after the interior economy of the company, etc.

Reservists are called out for training during the manœuvres, but are not permanently attached to particular Regiments, etc.

Staff Rides, etc. are carried out under the Chief of the Staff, and last 10 days. Cavalry manœuvres and long-distance rides are also carried out.

Field Manœuvres generally take place in November, one Division manœuvring against another. The highly cultivated land much restricts the manœuvring.

Drill, etc.—The Drill Books are compiled from the German Regulations, with some extracts from the French. The Officers' Military Association encourages and furthers the translation of foreign military works, etc.

Military Spirit.—The military spirit of the nation is good. The soldiers' position has been traditional, and is a high one. Yet there are many difficulties in transforming the Old World Japanese citizen into a modern soldier. The hard boots instead of soft shoes, the tight uniform instead of loose garments, the sitting on chairs instead of on the ground to eat meals, the upright bearing and stiff military salute instead of the profuse bowing and slouching gait are all difficult to assimilate. Still it is done somehow. The men are intelligent, eager to learn, and easy to teach. Universal service and compulsory gymnastic training in all the Elementary Schools much facilitate this. There are over 26,860 National Schools, and nearly 2,800,000 boys are trained therein, besides Middle, Normal, Higher, and Technical Schools.

The Infantry training is excellent, and their endurance in bearing the hardships of war is remarkable. Strict discipline is enforced at all exercises, and the men are held well in hand by their officers. Their fire discipline is very good. They seem to rather encourage frontal attack. The discipline is excellent, and the men give their officers little trouble.

The Cavalry do not individually ride well owing to their indifferent horses, consequently they prefer closed formations, wheelings, etc.

The Artillery shoots well; but its mobility is hampered by the want of good handy horses. The Engineers are good. The soldiers' devotion to the Imperial Dynasty is extraordinary. The Japanese are a patriotic people, with the national feeling strongly developed.

Clothing, Armament, and Equipment.—The troops are all dressed in uniforms of European pattern of dark colour; the Infantry wear grey linen gaiters, the cavalry knee boots. The former carry the 256-inch

Arisaka magazine rifle of 1897, which has 5 rounds in the magazine, and is sighted to 2,000 metres, and has a dagger bayonet. It somewhat resembles the Mauser. They carry 120 rounds on their persons. The Cavalry have carbines sighted to 1,500 metres, and swords. Their non-commissioned officers and those of the Train carry revolvers, as do also the gunners.

The Field Artillery have a so-called quick-firing Arisaka field gun, about 291-inch calibre, with a spade attachment. The mountain gun is of the same calibre, but lighter.†

The Engineers have portable pontoons.

The Transport have light carriages, and make use of many pack animals.

The Medical Service is good, and the health of the Army well spoken of.

The Regiments have no bands, but march by bugle (4 bugles per company). Drummers are not yet introduced; but this is in contemplation.

RUSSIA.

The latest Reports available show the 3 Siberian Army Corps to have had the following composition. (It is understood that Railway and Technical Troops, Garrison Artillery, etc., are in proportion):—

1st Corps.—The Rifle Brigades, Nos. 1, 2, 6=12 Regiments=36 to 24 Battalions.

An independent Rifle Brigade, No. 7, at Vladivostok=12 Battalions.

The Ussuri Cavalry, with 3 Regiments=18 Sotnias.

The 1st Artillery Brigade, 8 Batteries and 2 Mortar do.=10 Batteries.

1 East Siberian Engineers Battalion.

2nd Corps.—The 5th East Siberian Rifle Brigade=4 Regiments=8 to 12 Battalions.

Cavalry.—1 Trans-Baikal Regiment. 1 Amur Cossack Regiment, with from 12 to 15 Sotnias.

Artillery.—2nd Artillery Brigade of 4 Battalions, with 2 Batteries of Trans-Baikal Brigade Division (?).

This weak Corps has possibly been strengthened.

3rd Corps.—The 3rd, 4th, and 9th East Siberian Brigade=12 Regiments=24 to 36 Battalions.

Cavalry.—The Trans-Baikal Cossack Brigade=2 Regiments=12 Sotnias, and 2 Horse Artillery Batteries.

Artillery.—The East Siberian Brigade Division=3 Batteries.

Engineers.—The 3rd East Siberian Engineers Battalion.

In Port Arthur is the 8th East Siberian Rifle Brigade (Independent)=4 Regiments=12 Battalions in garrison.

† Details of the armament of the Japanese Army were given in the JOURNAL for June, 1904, p. 735.—E.G.

The organisation of the Russian Army is well known to our readers. It has not changed since 1900 materially.† The Report repeats, as it does annually, all the details of this, and tabulates the Corps, Divisions, etc., in full, for which we cannot, of course, find space in this *précis*.††

In 1902 the Report says von Tettau††† estimated the total strength of the Russian Army on a war footing as about 3,000,000, including officers; the *Opoltschenie* at about 700,000, and since then the forces in the Far East have been increased by at least 20,000 men.

The Ist and VIIth Army Corps, which are said to have been despatched thither, have each 2 Divisions=4 Brigades=8 Regiments =32 Battalions, 2 Brigades Field Artillery=2 Mortar Regiments, etc.

The Report gave the probable strength of the Russian Forces in the Kwantung Peninsula at the beginning of this year (1904) as about 4 Rifle Brigades=36 Battalions, 4 Regiments Cavalry=21 Sotnias, 11 Batteries Artillery, including 2 Horse Artillery, 2 Batteries Garrison Artillery, 5 Companies Engineers, 4 Railway Battalions. Besides there were the 4 Brigades of Frontier Guards. Altogether there would be in the Military Districts of the Amur and Kwantung under Admiral Alexeieff, including Manchuria, about 72 Battalions Infantry, 35 Squadrons and Sotnias, 19 Batteries Artillery, 2½ Engineer Battalions, 6 Railway Companies, 1 Company Train. There were the garrisons of the Fortresses in addition.

Taken altogether, including reinforcements at that time, the Russians could, it was thought, reckon on placing in the field about 120,000 men, and further reinforcements would doubtless be detailed from Russia and be on their way.

The Reorganisation of the Head-Quarter Staff—On the 24th April the Head-Quarter Staff of the Russian Army was reorganised on the lines contemplated for some time, and the Report gives full details of these changes.

The Commander of the Kiev Military District, General Dragomiroff, the well-known military writer, resigned his command owing to bad health, and was called to the Higher War Council. General Ssachomlinoff replaced him. The place of General Mussin-Puschkin, who died while in command of the Odessa Military District, has been filled by the appointment of the Cavalry General Baron Kaulbars. Admiral Alexeieff was appointed Governor-General of the Amur District, Manchuria, and of the Kwantung Peninsula in Port Arthur, with full powers over the political arrangements throughout Manchuria, the East China Railway, etc., as well as over the general operations of the Fleet. He was empowered to communicate with the Tsar personally on all matters. The Commanders of the Military Districts were to report to him every detail of their commands. They would then form two Districts: the Amur and the Kwantung.

Lieut.-General Linewitsch was appointed to the command of the Amur District.

† The armament of Artillery and other details were given in the JOURNAL for June, 1904, p. 739.—E.G.

†† This was given in the JOURNAL, March, 1898, p. 299; see also June, 1904, p. 738.—E.G.

††† See last year's *précis*, JOURNAL, October, 1903, p. 1127.—E.G.

A Higher Defence Committee was formed at St. Petersburg, under the Presidency of the Tsar, of which Alexeieff was appointed a member.

In order to enable him to control the vast area over which he had authority, the Admiral was given a large naval as well as a military staff.

In 1903, Cadet Schools for boys of noble birth but inadequate means were established. They are similar in their arrangements to the Cadet Corps Schools, but the scholars pay a yearly sum of 200 roubles only. They enter from 11 to 15½ years of age. Those who are specially recommended for it may pass into the 6th Class of the Imperial Cadet Corps. Others pass without further examination at the end of their course into the Yunker Schools.

The Finnish Cadet Corps at Friedrichshamm has been abolished, and all young Finlanders aspiring to become officers must now either pass through the Russian Cadet Corps or enter the Russian War or Yunker Schools.

Manœuvres, etc., in 1903.—The training of the Troops in the camp of *Krassnoye Selo* (1st period) lasted from the 14th May to the 18th July; the 2nd period from the 19th July to the 13th August; the greater manœuvres from the 14th to the 23rd August.

The *Imperial* Grand Manœuvres took place under the Grand Duke Vladimir in the Petersburg and Plow Military Districts, ending near Plow. About 70,000 men took part in them. The Northern Army was commanded by the 1st Corps Commander, General Baron Meyendorff, and the Southern by General Kakanoff, the 20th Corps Commander.

The Troops of the 1st Siberian Army Corps held manœuvres between Vladivostok and Nikolsk-Ussuriski, under the personal direction of the War Minister (Kuropatkin). As a demonstration against Japan, Adjutant-General Alexeieff, the newly-appointed Governor-General in the Far East, held combined Manœuvres of land and sea forces in October, 1903, at which about 47,000 men of all arms were exercised.

The Troops of the Reserve were also called out for training. The Infantry and Field Artillery of 3 years' service or less for 21 days. Those of over 3 years for 14 days; the *Opoltschenie*, as usual, being trained in their own districts by their own commanders.

Supplementary.—At the end of January, 1904 (old style), the following important changes and additions were made in the Eastern Siberia Army:—

A 9th East Siberian Rifle Brigade was ordered to be formed from the newly-raised Regiments, Nos. 33 and 36, each consisting of 3 Battalions. The cadres of these new formations and of a 10th East Siberian Brigade which was to be subsequently added were to be taken from Troops of the regular forces in Russia-in-Europe.

On the 28th January, 1904, the 3rd and 4th and above-mentioned 9th East Siberian Brigade were ordered to combine in forming the 11th East Siberian Army Corps.

The Cavalry, Artillery, and Engineers as given on p. 1136.

The whole were brought up to war strength by calling in the Reserves, and mobilised by the 28th January.

The whole of the (36) East Siberian Regiments (Rifles) were to have 3 Battalions instead of 2, formed partly from the existing 2 Battalions and partly from Troops in Russia-in-Europe.

From the Troops in the Military District Siberia (proper), 2 Siberian Infantry Divisions=8 Regiments=40 Battalions were available, with 6 Siberian Cossack Regiments, of which 4 were grouped in a Siberian Cossack Cavalry Division, and 4 Brigades of Artillery, each of 2 Battalions.

These Troops were to unite, and form a IVth Siberian Army Corps.

Discipline, etc.—Latterly, and particularly in 1903, the Russian people, especially the proletariat of the large towns, displayed a spirit hostile to the Army and its officers. Personal attacks were made on officers, leading to more than one catastrophe. One officer committed suicide after having neglected to defend himself with his weapons on the first shock of the attack made on him. The law as to self-defence in such cases has been much discussed.

Severer measures have been taken for the punishment under Military Law of the betrayal of military secrets.

Fresh encouragement has been given to the furtherance of the religious spirit and of warlike patriotism by the building of 30 new garrison churches, and by the holding of memorial services for fallen heroes, the celebration of the 50th anniversary of the Defence of Sevastopol, etc.

PART II.

Reports on the different Arms of the Service, and on progress in the Military Art, etc.

II.—TACTICS OF INFANTRY AND OF THE COMBINED ARMS IN 1903.

This portion, from the pen of the well-known writer, Major Balck, German General Staff, is of especial interest.

The Experiences of the South African War.—The Report repeats much that has been said before on this subject, and draws attention to the well-known publication by the German General Staff—“Episodes of History. Experiences of War beyond Europe. Colenso, Magersfontein, etc.”—of which the conclusions, it says, confirm those arrived at in the Von Löbell Reports for 1902. As a *précis* of this publication was given in the JOURNAL for May, 1904, p. 586, it need not be further alluded to here, for the Report emphasises many points dwelt on in it, especially as regards our fear of incurring losses, which were therein dealt with, and the want of resolution in not attempting to carry by night positions assailed in vain by day, etc. Experiments were made in January, 1903, with Troops dressed in different coloured uniforms, and it was observed that on the whole khaki and grey-green were the least conspicuous. Troops lying down with knapsacks on were much more so than without.

“On the whole,” it says, “we may look with equanimity on the South African experience. The conviction is being arrived at that the principles of the German Training Regulations, properly understood and applied, would have undoubtedly conquered the Boers. Nothing is more fatal than to inculcate the *impossibility* of frontal

"attack in the open as an unconditional principle. Now more than ever does the personal element assert itself side by side with fire effect."

INFANTRY.

GERMANY.—In the new (3rd) edition of Major Balck's *Tactics*, Vol. 1., the latest regulations for training of the chief European Armies are given, and the experiences of the Boer War summarised.

The "Tactical Problems" of General Reisner v. Lichtenstern, which appeared in the "Jahrbücher," dealt with the psychology of the battle-field. Colonel v. der Goltz has, in his "Training for Battle," shown how drill and education can be adapted to this end.

FRANCE.—A memorandum issued by the 3rd Section of the French General Staff shows the views taken of the state of Infantry Tactics. This bears an impress of the present ideas promulgated by General Kessler in 1902.†

It states that, taught by the experiences of the Boer War, the British Infantry attack was revised by Lord Roberts in 1902. It does not, however, solve the problem of how to pass over the death zone extending 1,000 metres from the defenders' position. Germany seems only now to have learnt the lessons assimilated by the French 30 years ago. In Russia, though its formations have not been altered, the Army seems to have clearer ideas than any other of the requirements of modern battle. In Austria they have contented themselves with increasing the breadth of front, and the advance in narrow columns.

Infantry must, says the memorandum, avoid open ground when within effective artillery range, choosing ground and formations which shall conceal their advance. Groups, not unbroken lines, must be formed, which, as long as they can do so under cover, advance uninterruptedly without firing or lateral movement. When it is impossible to continue the advance without firing, this must be opened. To strengthen this, they are then reinforced by other groups until no more rifles can with effect be brought into line. Forward rushes are not to take place on every reinforcement, but only when the defenders appear shaken. Officers and N.C.O.'s choose the fresh positions for their sections, etc., and lead them forward. Open ground is to be crossed by sections, groups, or by creeping man by man. The groups, supported by their reserves, and eventually strengthened by parts of their second line, gradually gain ground, leaving lateral spaces between them, which are covered by the troops in rear. Thus isolated combats, through which the leader will have obtained a clear idea of the situation, will be fought. He can then support with his Reserves those points of attack which seem to have the best chance of penetrating the position, or choose that portion of it against which he will throw his Main Force. This is to be brought up under cover of the advanced fighting bodies without halting, till it can carry the latter forward to the assault with it. These being the guiding principles of the Infantry combat, no sub-division into Firing Line, Supports, and Reserves is required. Distances will be kept according to the nature of the ground, and the greatest latitude will be left to all leaders. A wider front will be taken up in attack as well as in defence.

† See the JOURNAL for October, 1903, p. 1156.—E.G.

These views as to the nature of modern attack are not quite in accordance with the existing "Infantry Training," so we may expect to see this altered. In the camp at Chalons it was tried, and a reporter of the *France Militaire* says that thin firing lines, with 4 or 5 metres interval, and simultaneous movements of the skirmishers with rapid firing, were the chief characteristics observed, with an unmistakable disinclination to use shelter-trenches.

In the New Field Service Regulations *avant-postes irrégulières* (March "Outposts") are used, with groups of 4, 6, or 8 men, called *postes à la Bugeaud*, which push forward single or double sentries about 50 paces. These can be used instead of the chain in broken, close ground, or in front of the line of Outposts, like the Russian *Sekrety*.†

In marches much stress is laid on order and discipline. The importance of the careful, individual training of every man in an Army is insisted on.

Officers are to take care that men only slightly wounded do not retire out of action, but are attended to as early as possible, and that no fighting men, but only the stretcher-bearers, are used as carriers.

JAPAN.—The Infantry training is carried out on German lines (excepting that Fours are formed on the French system). Formerly, whereas the restricted parade grounds induced an adherence to too close formations, we now see a tendency in the larger practice grounds to over-extension.

The *German Infantry Attack*, a brochure published in the *Militär Wochenblatt*, seems to have been taken as a guide to their training. In this they displayed excellent fire-discipline, and coolness in shooting, with quick powers of observation.

It seemed, however, says the same eye-witness, that there was greater attention paid in attack to the simultaneous advance of the whole line than the utilising by individual units of the opportunities presenting themselves. There was a decided tendency to the offensive.

RUSSIA.—The "Infantry Training" of 1900 is still in use. It differs but little from the previous one. "*Jagd Commandos*" (special sharpshooter companies) continue to be trained, though much opposed. It is considered that there are more opportunities now for the employment of specially trained men, who, being good cyclists, judges of distance, etc., are particularly useful in the first line. But as these may not always be available at the critical moment, it is questioned whether their chance employment makes up for depriving the companies of their best men as "specialists." Their marching performances were remarkable.

The *Meldereiter* (mounted messengers) are no longer taken from these special sharpshooters, nor are they to be employed in scouting, but exclusively as orderlies.

GERMANY.—The Imperial Manœuvres of 1903 took place in the vicinity of Merseburg between the IVth and XIth Corps, with the "A" Cavalry Division attached, and the XIIth and XIXth Corps, with the "B" Cavalry Division attached. An Infantry General commanded the former, and a Cavalry General the latter. The Cavalry were in greater proportion than usual. On the 11th September, the

† These do not differ materially from the British group system.—E.G.

German Emperor united the 2 Cavalry Divisions and 3 Infantry Army Corps under his command and led an attack upon a position held by 2 Army Corps.

The Heavy Artillery of a Field Army has now been assigned its place on the march after experiments as to its being able to keep up with the marching columns. Manœuvres have shown the importance of this arm, not only for the attack on entrenched positions, but also for the encounter battle.† As a rule, it is to follow the main body of the Infantry in a column. When the column, however, is marching with a view to an attack upon an entrenched position it will be as far forward as the Commander judges necessary to admit of the timely action of the guns. Bearing in mind the great depth of a Battalion†† of Field Howitzers (1,100 metres without and 1,500 metres with wagons) it is considered as a rule best to treat them as Field Artillery as regards their place in column of route.

Much has been written in 1903. Two important works issued by Section I. of the German General Staff, "*Breaking off Actions*" and "*Success in Battle*" were issued. The difficulties of the former have increased, and are only possible when Troops remain echeloned in depth. It is especially difficult for the defenders, for on any cessation of their fire the attackers may storm the position. But it is also difficult for the attackers, as any pause in their advance has almost the effect of a retreat, and offers an energetic defender a decided advantage.

Battle situations such as depicted in these studies, however, partake more of the character of "*Reconnaissances in Force*," which are, according to modern views, seldom advisable now unless increased fire-effect or peculiarities of ground exceptionally demand them. The increased number of guns brought into action now and their greater effect may seem to favour it, but as now the fire-effect of thick swarms of skirmishers is also much greater it is difficult to break off this when forces are engaged at medium distance.

It is an essential condition to success in battle that it must be arranged beforehand to bring the main strength to bear on the enemy's weakest points—that is, his flanks. In battles on a great scale, however, once the commander of an Army has engaged his Army Corps he can no longer influence the battle. The issue lies with his subordinates and his Troops. It depends on the prudent energy of the former and on the capabilities of the latter. The leading idea of the volume is that none of the great commanders always acted in the same method.†††

Lieut.-Colonel Kreuzinger's "*Problems of War*," which are based on a philosophical study of Frederick the Great's and Napoleon's victories, are mentioned, also Colonel Hanschid's "*Applied Tactics*," and a "*Collection of Tactical Exercises and their Solution*," by Captain Hoppenstedt (Mittler). The IIIrd and IVth Volumes of Major Balck's exhaustive "*Taktik*," 3rd edition (Eisenschmidt), are quoted.

† The present Russo-Japanese war has demonstrated more than ever the great tactical importance of heavy artillery.—E.G.

†† A Battalion of Fuss-Artillerie is from 4 to 6 companies strong.—E.G.

††† The Duke of Wellington's well-known dictum as to this will be remembered.—E.G.

FRANCE.—General Langlois and General de Négrier, both members of the Supreme Council of War† and Inspectors-General of Troops, have expressed their different views in regard to Battle Tactics. Last year†† we drew attention to the opinions of General de Négrier and of General Kessler, which favour long, thin firing lines, small columns working forward together, combination of frontal and flank attacks, dismounted action of cavalry, etc. Opposed to this are General Langlois' ideas, with which General Brugère is in accord, as is also General Bonnal. His views are briefly:—

1. Frontal attack is more difficult. Hence wider extension and necessity for a higher moral and intellectual training of the soldier.
2. Improved small arms favour enveloping flank attacks, which necessitate greater manœuvring power.
3. Improved Artillery fire favours frontal as well as flank attack.
4. As extension becomes greater, so much the more must the decision be sought for in powerful concentration against one portion of the front.

General Langlois therefore considers the German Emperor's plan of breaking through at one point with heavy Cavalry masses as by no means a parade manœuvre merely calculated to raise the spirits of his cavalry, but a well-thought-out and practicable plan of action.

5. The defence must be conducted more by depth than by breadth, as few troops being shown as possible at first, the bulk being kept in hand to fall on the attacker when he is exhausted by his long advance under fire. To this end mixed detachments are to be pushed forward by the defenders to withdraw slowly fighting and leading the attacker into the snare prepared for him of a powerful artillery position covered and concealed by a few weak skirmishers only.

He considers the value of the more Permanent Works to have diminished, and that of Field Works to have increased, the latter being in the form of shelter-trenches many lines deep.

To sum up the Langlois proposals, they may be said to be the application of the Napoleonic Mass principles modified according to the requirements of modern war. He rightly rejects the idea that the tactical surrounding is the only possible method of attack. He believes, relying on the experience of Plevna, that frontal attack is still possible, though difficult. He does not consider it sound to look on the experience of the Boer War as proving the contrary. He agrees with General de Négrier in the difficulty of thorough reconnaissance, and thinks this may be overcome by pushing forward mixed detachments, while de Négrier advocates the use of Mounted Infantry only. Both agree in the necessity for the thorough co-operation of Infantry and Artillery.

But, after all, the main difference in their views is that de Négrier upholds the necessity of the tactical surrounding, whereas Langlois advocates massing to break through at some point of the enemy's line.

† General Langlois has retired since the above was published.—E.G.

†† See the JOURNAL, October, 1903, p. 1134.—E.G.

RUSSIA.—A strongly developed tendency to the attack is remarked on by all reporters,[†] but this apparently culminated in a number of partial engagements often lacking in unity of action.

The attack of the Russian Army is essentially a normal one—that is, each Army Corps attacks precisely as the others do. The firing line, at the outset weak, is continually reinforced. The advance is by rushes by strong detachments moving on a broad front. The nearest reserves are kept rather far back in open order, but the great reserves advance in strong columns, keeping step, more often with bands playing into action even under heavy artillery fire.

The Cavalry were given plenty to do, as the two sides were 200 kilometres apart (125 miles). The umpires had to see that the Infantry carried their packs full, and that the Squadrons took the prescribed number of horses with them and did not leave them behind on any pretence. The Cavalry Division of the Guards particularly distinguished itself, making a night march along bad roads, and overwhelmed a Regiment that had pushed forward in fancied security to occupy Pekow. The Cavalry, with its accompanying Horse Artillery, often fell upon the flanks of the hostile marching columns.

The Train was reorganised in 1903. Part of the long Division Provision Trains have been now kept back and united in an additional Corps Provision Train. On the other hand, all the three-horsed Divisional Train Wagons have been changed into two-horsed wagons, reducing the weight carried by each to 458 kilos (8½ cwt.). This increases the number of vehicles from 168 to 210.*

Each body of Troops has its Regimental Transport. The Divisions have a Divisional Train; each Corps (including the Cavalry Corps) a Corps Train. The Provision Train of a Division is in 5 sections, that of a Corps in 4 sections.**

The Imperial Manœuvres took place near Pekow, under the Grand Duke Vladimir. Special mixed detachments were much used to lay ambushes, carry out attacks on convoys, trains, depôts, etc., to break up roads, destroy bridges, etc., on the enemy's line of march; in fact, to play the part of guerillas with all their energies. These detachments were to be quite independent of the bodies of Troops from which they were detached, but, while seizing of their own initiative under their own leaders, every opportunity of harassing the enemy within their *rayon*, they were to keep their own side informed as to his whereabouts.

CAVALRY TACTICS.

General.—In general the conviction is making its way that Cavalry has gained in importance rather than lost by the improvements in modern arms of precision. Even in England, where, owing to the value of dismounted action being over-rated, Cavalry is only employed tactically as Mounted Infantry, Lord Roberts is careful to try and obtain the best officers for the Cavalry arm on account of

[†] This does not seem hitherto to have maintained itself in the Russo-Japanese war.—E.G.

* For details see *Militär Wochenblatt* No. 136, and *Internationale Revue*, January, 1904.

** For details, see *Strenleur*, December, 1903, and *Internationale Revue*, No. XXX., 431.

the great intellectual as well as bodily demands which in the present day Reconnaissance makes on it. Theoretically the Cavalry of all European Armies sets a higher value on dismounted action than before the South African War. Practically this has only been carried out on a large scale in England, France, and Russia; in Austria-Hungary rather less so, and in Italy and Germany at their great Manœuvres very little.

First the British Cavalry lost the lance, received the Infantry long rifle as their chief weapon, and actually rode to the Autumn Manœuvres of 1903 without swords.

In France the greatest stress is laid on fire action on foot; but the use of *l'arme blanche* where feasible is not rejected.

These two are the only countries which have thought the improvements in firearms necessitate radical changes of tactical formations when within effective hostile range.

In Germany, Generals v. Pelet-Narbonne and v. Bernhardt declare a more thorough training in the shooting of Cavalry even in large bodies necessary. In all countries attempts are being made, by attaching to them Machine Guns, Mounted Infantry, and Cyclist Companies, to increase the fire power of bodies of Cavalry.

By improvements in Cavalry rifle training, by better weapons, and by increased ammunition supply, they hope to enable dismounted Cavalry to carry on a prolonged fight, either offensive or defensive, against Infantry. This is delusive. The withdrawal of the horse-holders and their escort and of the Mounted Scouts reduces to a small number the rifles that can actually be brought to bear even by a whole Cavalry Division, so that no great effect could be produced on the flanks even of modern Armies where Reserves would be certainly echeloned. In scouting, outpost service, and in detached fighting, Cavalry may often act dismounted with advantage. Even in battle it may be better in certain cases to let them make use of their carbines than to await inactive behind a hill that opportunity for attack which has so often been missed. *Cavalry will never obtain great successes with their rifles*, but only when mounted, by utilising their great speed and their opportunities for surprise. If von Bredow's Cavalry had possessed at Mars-la-Tour a long-ranging rifle, and had dismounted to fire, they would scarcely have stopped a single Infantry Regiment, whereas by their so-called death-ride they stopped the advance of an Army Corps. As regards losses, it has been stated that, at Eylau and Esslingen, Napoleon's Reserve Cavalry Corps lost more than the whole of the German Cavalry in 8 months of the war of 1870-71.

Every victory in which the Cavalry takes no part, every defeat which the Cavalry does not sacrifice itself to avert must be looked on as a reproach to the Cavalry of any Army.

For the battle, Cavalry masses must be carried forward to threaten the enemy's flank far in advance of their own flanks. This will enable large bodies of Artillery to get round to concentrate their fire on the enemy's flank. In 1870-71 there was often no room for the batteries to deploy in front. Owing to the general increase of the Artillery this will now more than ever be the case; their obvious employment against the flanks is indicated.

Their effect against the hostile Reserves and in enfilading their lines of batteries will be much greater than that of frontal fire

against shield-protected guns. Co-operating with them the Cavalry will work round the enemy's flanks and protect their own.

The writer reaffirms his predilection in favour of the lance, and says:—The following Powers arm their Cavalry with the lance:—

Germany.—The whole of the Cavalry, except the Mounted Rifles, are armed with hollow steel lances $11\frac{1}{2}$ feet long.†

France.—Both ranks in 17 Dragoon Regiments of the 8 Cavalry Divisions and some of the other Dragoons carry bamboo lances $10\frac{3}{4}$ feet long.

Italy.—The first 10 Cavalry Regiments carry hollow steel lances $9\frac{3}{4}$ feet long.

Russia.—The front ranks of the Don, Oranberg, and Ural Cossacks carry lances of lancewood.

Belgium has 4 Lancer Regiments.

Turkey.—The 13 Regiments of Kurd Irregular Cavalry and many of the Indian Native Cavalry Regiments carry them.

England.—The Report gives in brief the memorandum of Lord Roberts which accompanied the order to arm all the British Cavalry with the long rifle, but says that numerous advocates of the retention of the lance have written to the *Times*, etc., letters urging this, and among them Lieut.-General Wilkinson. It reports that the sword is still to be carried for the *mêlée*, but that the greatest weight is laid upon shooting and dismounted action, which — and especially on rapid dismounting—the cavalry of high-lows and putties favour. The Report draws attention to the efforts to abolish excessive luxury in the Cavalry, and to the order allowing officers to use horses from the ranks.

Austria-Hungary.—In Austria great attention is being paid to the shooting of Cavalry and to Reconnaissance, in which the Militia Cavalry are trained very thoroughly each year. Long distances are marched, patrols sent out in full strength, detached, and contact squadrons practised, etc.

A short account of the Cavalry work in South Hungary and a more detailed one of the Great Cavalry Manœuvres in East Galicia, near Komarno, with a good sketch-map.

The general impression of the Austrian Cavalry was very favourable. The horses were fresh and in good working condition, the officers well mounted, the marches were regularly executed and in good time; the jumping was good. To one Militia Cavalry Regiment only was exception taken as regards horsemanship and horsemastership. The Reserve of Horses system has worked well. There are now 26,000 trained horses used for training the Militia Cavalry. Machine Gun Detachments took part in the Cavalry Manœuvres.

France.—An account is given (taken from the *Militär-Wochenblatt*) of the Autumn Cavalry Manœuvres held under General Poulléau near Réthel, on the Aisne. The 4th and 5th Cavalry Divisions with Engineers on bicycles, and the 2nd and 6th Cavalry Brigade, 1 Bicycle Company, 1 Section Machine Guns, and the 84th Infantry Brigade took part in these. The Cavalry did not use much dismounted action, but attacked on horseback, and their general condition, riding, etc., were praised; but greater rapidity of movement and better

† These appear to be much heavier than the bamboo lances.—E.G.

utilisation of ground, adaptation of formations to it, etc., were demanded.

Great Britain.—The Autumn Manœuvres of 1903 around Hungerford and on the Berkshire downs are described at some length in the Report. The strenuous marching of General French's troops and the *élan* of their successful Cavalry charge on the last day are much praised; as also are the quiet way in which all worked by signal, and the dismounted action of the Cavalry. The signalling is especially commended.

Italy.—The Italian Army received its new Regulations for Field Service in 1903, in which the lessons of the Boer war are skilfully handled without exaggerating the advantages of the defensive or depreciating those of the offensive.

Cavalry Divisions are to precede the Army by one or two days' march in order to give the columns marching on an extended front time to concentrate. If no Cavalry Division is available, then each column is to send forward its own Cavalry for Reconnaissance. On gaining touch with and reconnoitring the enemy, the Cavalry may occupy and hold, dismounted, important points until the arrival of the Infantry. The Cavalry leader is to be allowed a free hand in action. While the effect of modern improved firearms is taken into account, so also is the moral value of Cavalry action, if the right moment is chosen and rapid decision and bold daring shown in execution.

Light Artillery and Cyclist Companies are attached to the Cavalry for pursuit, which is to be active and relentless.

Royal Manœuvres were held in Italy in 1903 for the first time since 1899. Two Armies assembled in the neighbourhood of Venice. A Northern Army of 5 Army Corps (Red) with a Cavalry Brigade and some Alpine troops against a Southern Army (Blue), which had 3 Army Corps, a Cavalry Division, and some Alpine troops. This Cavalry Division consisted of 1 Lancer Brigade and 1 Light Cavalry Brigade (each of 2 Regiments), 2 Batteries of Horse Artillery, Engineers, Signallers, etc. Each Cavalry Regiment had 24 messenger pigeons with it. A small proportion of the latter reached home and were useful, their messages being at once telegraphed to their destination.

The work of the Cavalry throughout is much praised.

FIELD ARTILLERY TACTICS.

General.—The expectation that the year 1903 would see all the principal European Armies rearmed with modern artillery has been but partially fulfilled. In certain States, especially in *Germany*, the results of experiments which shall enable them to adopt a gun, etc., fulfilling every possible demand, are awaited.

Only France has changed the tactical principles of artillery action in the fight in accordance with the possibilities of its new weapons.

The shield question is still being discussed; but the barrel-recoiling Q.F. field gun seems to have established itself.

The Report enters into a detailed Defence of the German Light Field Howitzers,† which we have not space to reproduce. It says

†Of 1898, calibre 4.1-inch. The batteries are attached to some of the Infantry Divisions.—E.G.

they are necessary to reach troops behind cover, enlarges upon the moral effect of their curved fire,[†] and says that the bugbear of the impossibility of carrying sufficient ammunition is a myth. It was found impracticable to rest content with one field gun for all purposes. The Report therefore advocates their retention, and says it is even a question whether they should not form part of the Artillery of all Infantry Divisions. It quotes from General von Hoffbauer's book on Field Artillery, published in 1903, which is founded upon the experiences of 1870-71, and which does not recommend the reduction of guns from 6 to 4 per battery, as the French have done.

France.—In France, notwithstanding the confidence shown in the 75-mm. (2·95-inch) Q.F. field guns, fears are gradually being expressed that the number of guns now in an Army Corps are not sufficient to cope with the Germans. *La France Militaire* thinks the number ought to be 6 guns per 1,000 Infantry, as in Germany. The question of motor traction for field guns as saving the cost of horses is being considered, and it is thought that notwithstanding the expense the number of guns may be gradually increased, as, though the German guns are inferior, there are many more of them, and they may be improved. This agrees with the opinion expressed in our previous Reports, that though the number of guns in the batteries may be reduced, the total number in an Army Corps should not be.

A new issue of "Field Artillery Training" was issued in June, 1903, replacing that of 1901 (provisional).

The composition of the ammunition columns, parks, etc., and their place in the line of march is given.

The Report gives the various field practices held in 1903 and the criticisms on them, and says there was nothing to remark on as regards the French Artillery Tactics, at either the Army Manœuvres or the Cavalry Manœuvres of 1903.

Great Britain.—The Report devotes unusual attention to British Artillery Tactics. It reproduces pages of the Artillery part of "Combined Training." It gives the Remarks of Lord Roberts on the choosing of Artillery positions at the Autumn Manœuvres of 1903 in detail, as well as extracts from the Report of the Inspector-General of Field Artillery in India for 1902-3.

Russia.—New Field Artillery Regulations were issued in 1903 as the result of the experiences of those of 1899.

Switzerland.—The Report to hand of the Swiss Manœuvres held in 1903 show that the batteries were well handled, and on the whole worked satisfactorily, the difficulties of the ground being energetically overcome. They were sometimes late coming into action, which is attributable to the *matériel* being somewhat heavy for the ground. Here and there want of proper co-operation with the Infantry was observed, and such faults as change of position under heavy fire of superior Artillery, etc., were noticeable. It is proposed to reduce the 6-gun batteries to 4, but with 10 ammunition wagons per battery,

[†] The previous Reports condemned the British 5-inch Howitzers as having produced little effect in the Boer War, but enlarged upon the excellencies of the Heavy Howitzer (5·9-inch) against entrenched positions.
—E.G.

which are to carry 800 rounds per gun, as will also the Corps Park ammunition wagons.

A new mountain gun with recoiling barrel was tried, and gave results far more satisfactory than those of the old mountain gun. It proved a very light and handy weapon. It, however, requires 4 mules instead of 3, which sufficed for the old pattern.

ARTILLERY MATÉRIEL IN 1893.

Austria-Hungary.—No decided progress has been made. The Commission on Quick-Firing Field Guns, etc., which has been sitting for 7 years and making all kinds of experiments, has come to no definite decision as to the merits of the Skoda and Ehrhardt systems.

Belgium.—The Report gives a very short account of the new experiments made with the Krupp, Ehrhardt, St. Chamond, Skoda, and Cockerill barrel-recoiling Q.F. field guns, which took place on the 15th September, 1903. 250 kilometres were marched, and the guns then brought into action at various ranges. The Report does not give the results.

France.—New regulations for ammunition supply have been issued. According to these the 75-mm. (2.95-inch) Q.F. field gun carries in its wagons 312 rounds. The 80-mm. H.A. gun 142 rounds. In the Corps Park are 355 and 185. 2 wagons of the battery carry high-explosive shell. The shields are said to be 4.5-mm. thick (.18-in.) and proof against rifle bullets at 150 yards range. The weight of the gun with limber is believed to be 1,800 kilos. (about 35 cwt 1 qr.).

A new mountain gun, designed by Captain Ducrest, of 68-mm. (2.68-inch) calibre has given good results. It carries shrapnel (13½ lbs.), common shell (double), and case shot.

Great Britain.—The new 18-pounder Field Artillery gun is described in the Report in some detail. It is said to have the improved breech-block of Colonel Deport, and to be capable of firing 29 rounds a minute and to have a muzzle velocity of 1706 f.s.

Each Cavalry Regiment has been given a 3.7-cm. (1.46-inch) calibre Pom-pom, of which the Gun Detachment (6 gunners, 2 drivers) is mounted.

Italy.—The re-armament of the Field Batteries with Q.F. (steel) field guns† (with spade attachment), Mark 75A, 75-mm. (2.95-inch) instead of the old bronze guns is now completed. The experiments with barrel-recoiling Q.F. field guns are being continued, no conclusion having been as yet arrived at.

The batteries retain their 6 guns; their ammunition wagons are increased to 10. They carry 194 rounds with the battery. The total provision of ammunition is 500 rounds per gun. There are 90 common shell carried. The ammunition boxes of the limbers are of aluminium.

Japan.—The Field Artillery is armed with the 75-mm. (2.95 inch) Q.F. field gun on the Arisaka system. The fortress and siege guns are mostly new steel guns of 12-cm., 15-cm., 24-cm. and 28-cm. (4.7-inch, 5.9-inch, 9.4-inch, and 11-inch) calibre; but several of the old bronze type are still in use.

† Details were given in the JOURNAL, October, 1903, p. 1147.—E.G.

Their battle-ships carry, of the heavy type, 30.5-cm. (12-inch); of the medium, 25-cm. and 15-cm. (9.9-inch and 5.9-inch); of the light 7.6 and 4.7-cm. (2.95-inch and 1.85-inch). The armoured cruisers have 20-cm. and 15-cm. (7.9-inch and 5.9-inch) and Pom-poms. The gun-boats carry 28-cm., 26-cm., 25-cm., and 21-cm. (11-inch, 10.4-inch, 9.9-inch, and 8.2-inch) guns; and the destroyers have only light Q.F. guns.

Holland.—The final competition held in August, 1902, between the Schneider, Cockerill, Ehrhardt, and Krupp Q.F. field guns, having resulted in the selection of those of the latter system, in October, 1903, the first consignment of these guns, which will amount to 204 guns and 608 ammunition wagons, was ordered. Of the latter, 200 were however, to be made in Holland.

The new gun (L/30) is of 75-mm. (2.95-inch), and weighs 350 kilo. ($6\frac{3}{4}$ cwt.). The carriage weighs 600 kilo. ($11\frac{1}{2}$ cwt.), the limber 800 kilo. ($15\frac{1}{2}$ cwt.). The gun in action weighs 950 kilo. (about $18\frac{1}{2}$ cwt.). The weight of its shrapnel is 6 kilo. ($13\frac{1}{4}$ lbs.). It carries 270 bullets, 11 grammes each. The muzzle velocity is 500 m. (1,640 f.s.). Range with common, 6,400; shrapnel, 5,600 metres.

Russia.—The gun chiefly in use is the Engelhardt, or "*Putilow*," M/1900 Q.F. field gun of 3-inch calibre. The carriage, which is furnished with a spade attachment, gives an awkward jump after firing. On this account, and that of the weight, it is thought no more of these will be manufactured. An improved pattern M/1902, with longer barrel-recoil will be selected. The heavy Field Artillery gun, 10.7-cm. (4.2-inch) has now been discontinued as a Field Artillery gun on account of its weight. Those Field Batteries that have not received the Q.F. field gun have the light Field Artillery gun, M/95, and the Horse Artillery gun, M/95, both of which have the spade attachment. The Field Artillery gun carries shrapnel, weighing $17\frac{1}{2}$ lbs., and common of $15\frac{1}{4}$ lbs. The muzzle velocity with the former is 1,410 f.s., with the latter, 1,460 f.s.

The Siege Park has 4.2-inch guns (L/32), heavy 6-inch guns, light 8-inch and 6-inch guns, 3.4-inch, 8-inch, and 9-inch field mortars.

The Navy guns are of the Obuchoff pattern, 30.5-cm., 28-cm., 22.8-cm., 20.3-cm., 15.2-cm., 10.7-cm., 8.7-cm. (12-inch, 11-inch, 8.9-inch, 8-inch, 6-inch, 4.2-inch, 3.4-inch). The heaviest Q.F. guns are the 20-cm. and 15-cm. (7.9-inch and 5.9-inch).

Switzerland.—After 10 years' experiments and a thorough study of the question, Switzerland has come to the very satisfactory decision to adopt a Krupp barrel-recoiling Q.F. field gun with steel protective shields. The simplicity and steadiness of the gun under fire, as well as its accuracy after repeated trials, led to this result.

The batteries have been reduced from 6 to 4 guns; the ammunition wagons increased to 10. The minimum number of rounds to be carried in the field per gun is 800. The gun and shield arrangement is much less complicated than that of the French. This gun has a calibre of 75-cm. (2.95-inch); the barrel is of nickel steel and 7 feet 4 inches long, and weighs only about $6\frac{1}{2}$ cwt. It fires over 3 feet 2 inches, the wheels being 4 feet 3 inches in diameter, and their track 4 feet 7 inches. The limber weighs $15\frac{3}{4}$ cwt.; firing weight $34\frac{1}{4}$ cwt.

† For details, see the JOURNAL for October, 1903, p. 1148.—E.G.

The chief ammunition is shrapnel, weight 13½ lbs., but common of the same weight is also carried. The muzzle velocity is 1,590 f.s. Some case are also used.

SMALL ARMS, 1903.

General.—The Report says that experiments are continuing in most European Armies with Automatic Rifles. Automatic Pistols have been adopted by Belgian, Swiss, Bulgarian, and (partly) the German Armies. The question of a practical automatic rifle adapted to war is, however, not so easy of solution. Officers of war experience are loth to give into the soldier's hands any weapon that will not remind him at each shot of the value of each round of ammunition. At the same time, they are aware of the necessity of providing him with one of a high class technically, so that he may, by using his brains, save his muscles and enhance his value by accurate shooting. The wish to entrust an ideal weapon to good shots only encounters, however, the difficulty of the huge Armies of two years' service men of to-day, the result of which is that the *average* soldier is of inferior quality. This can only be balanced by the creation of standing Armies of higher quality though less in quantity. This is an ideal that finds much support. Meanwhile, however, the tendency towards masses must be reckoned with, and therefore the chief arm—the Infantry—must be furnished with the weapon that is technically best fitted to sustain the psychological element in war, and to discourage the waste of ammunition.

PROGRESS WITH SMALL ARMS IN INDIVIDUAL STATES.

Austria-Hungary.—The Repeater Mannlicher M/1895 (.315-inch)† with some improvements, has now been issued to two-thirds of the Infantry. The latest issue is about 2 lbs. higher than the first. The barrel is protected by the stock till near the muzzle. It is sighted to 2,600 paces. The Cavalry have all received the Mannlicher Carbine (.315-inch). On the whole, these rifles are said to be quite up to the constructive and ballistic requirements of the day, and are considered high-class weapons.

France.—The Report gives some details of the new bullets manufactured for use with the Lebel rifle, mentioned in last year's Report.† It has a flatter trajectory, and inflicts severer wounds, as it flattens on impact, being of copper. It is long and pointed and lighter than the old bullet. It makes a peculiar whistling noise, which has a nerve-shaking moral effect. The rifles are now sighted to 2,400 metres. The accuracy obtained with this is calculated to reduce the probable average error in judging distance by 50 per cent.

Germany.—The arming of the German Infantry and Cavalry with the Mauser and Carbine of 1898 is not yet completed. It was thought by some that an entirely new rifle would be introduced, as so many items in the War Budget had been cut down, but in December, 1903, the War Minister, General v. Einem, declared that nothing was known as to the introduction of a new rifle to replace that of 1898, and that a reliable automatic rifle was hardly to be looked for in the immediate future. Certain minor improvements were from

† See the JOURNAL, October, 1903, p. 1149.—E.G.

time to time made in the rifle, which now goes by the name of Pattern '98/'02. A new cartridge has, moreover, been introduced which gives a much flatter trajectory and greater accuracy.

Great Britain.—The Report goes into details of the issue of the Lee-Enfield rifle to the Indian Army and to the Volunteers. The defects of the Lee-Enfield M/'03 are set forth in the *Kriegstechnische Zeitschrift* for August, 1903, by H. Angier, an engineer in London, who describes the mechanism of the rifle in detail, which is too technical to be transcribed here. The advantages and improvements are acknowledged, but it is condemned as far too complicated. It has double as many constituent parts as the new pattern Mauser, of which there are 48 very small sections a centimetre in size or less. Though the barrel is considerably shortened the ballistic performances of the rifle are improved, but it is doubtful if this will be maintained after some use. On the whole, Herr Angier considers it an unpractical piece of patchwork, which could only be rehabilitated by the radical reconstruction of its very elements. It is the breech action he chiefly takes exception to. Many English authorities, the Report says, agree with him. The *English Mechanic* says that owing to the short distance between the sights the precision of the aim and the "kick" is considerably affected.† The Hythe Reports of the shooting of the new rifle are all favourable, and *The Times* says that it is to be adopted. These conflicting opinions are characteristic of the state of things in the British War Office.

Holland.—The troops are armed with the 6·5-mm. (·256-inch) of 1895 (Mannlicher).

Japan.—The Infantry, Cavalry, and technical troops of the standing Army carry the Meidji 6·5-mm. (·256-inch) Rifle or Carbine No. 30. Length with bayonet, 5½ feet; without, 4·17 feet; weight without bayonet, 8½ lbs.; weight of bullet, 10·3 g. (159 grains); of 1 round ammunition, 22½ g. (346 grains); weight of clip with 3 rounds, 382 gr. (13½ ozs.). The bullet has a hardened lead core with a steel or nickel mantel. The muzzle velocity is 2378 f.s.; penetration in fir at 40 metres = 2·3 metres (7½ feet).†† The rifle is a Mauser, but with an altered chamber. The magazine holds 5 cartridges. When empty the breech cannot be closed. The powder used is a smokeless leaf powder from Itabaski.

Norway.—The Infantry carry the 6·5-mm. (·256-inch) Krag-Jørgensen rifle of 1894, cartridge of 1896.

Roumania.—This Army has the 6·5-mm. (·256-inch) Mannlicher of 1893. A new rifle with a steel-pointed bullet is under trial. A new smokeless powder is being manufactured at Dudescl, and in 1903 gave good results.

Russia.—The whole of the Infantry is now armed with the three-lined rifle, Model 1891, of 7·62-mm. (·312-inch), and the Cavalry with a carbine of the same pattern and calibre, but of 1896 manufacture.

† The success of the Hythe team at Bisley is in favour of the new rifle, but they were experts. It would seem advisable for the authorities to obtain a careful translation of the German Mechanic's Article, to see if the defects of the rifle are exaggerated.—E.G.

†† I give this as it stands; it seems very great.—E.G.

Sweden.—The Infantry has the 6.5-mm. (.256-inch) Mauser rifle of 1896.

Switzerland.—The Infantry has the 7.5-mm. (.296-inch) Schmidt-Rubin rifle of 1889 and 1896; the Cavalry the carbine of 1893 of same calibre, with the Mannlicher breech action. The cyclist companies and technical troops carry a short rifle, 1889 and 1900, of the same calibre. The cadets have a special light rifle of 1897. A Captain Otter is said (*Kriegstechnische Zeitschrift*, June, 1903) to have invented an arrangement by which the soldier is prevented from aiming too high. It can be attached to any rifle.

United States.—The re-armament with the new Springfield rifle† has been commenced. The magazine is generally loaded by means of a carrier, but it can be used as a single loader when the magazine is empty. It can then be refilled singly. The attached cleaning-rod can be fixed on the rifle as a bayonet. This obviates carrying a bayonet scabbard. The muzzle velocity has now been raised to 2,300 f.s. The penetration into fir at 500 yards is 18 inches, at 1,000 yards 8 feet 6 inches, at 300 yards into iron .29 inch. It is intended to have but one rifle for all Services. The Trial Committee therefore, after much experiment, reported in favour of the short rifle with a barrel 24 inches long, and in June, 1903, the War Minister decided on this. In December the 1st Infantry Regiment received it, and its issue is now being proceeded with, 350 rifles being turned out daily.

Experiments have, however, also been carried on with the Mondragon automatic rifle.††

A new broad web-cartridge waistbelt, carrying 90 rounds, and supported by shoulder braces, has been tried.

A Mr. Powell has invented an indicator which shows how many rounds remain in the magazine of an automatic pistol.

MILITARY BALLOONING, 1903.

No considerable progress has been made in military ballooning during the past year, as in most States satisfactory results as to material had already been obtained from experiments. Portable gasometers, which accompany the Troops in the field, are now generally adopted, owing to the saving of time in filling and starting thereby effected. Russia alone seems to adhere to the old-fashioned method of making the gas on the spot, but Russia is now rather behind the rest as regards war balloons. England, France, and Italy have light balloon sections with their columns for colonial wars, but most nations have their balloon detachments in fortresses only. Germany has the same arrangements for both fortress and field army balloon detachments, their material being interchangeable.

The German kite war balloon has proved itself superior to all, as it is of stronger material and capable of working in a heavy wind.

The English gold-beater skin balloon is, however, the most useful for colonial wars, owing to its small size and lightness.

The Report goes into the details of the performances of the British balloon sections in the South African War, taken from Colonel

† For details of the Springfield rifle, see the JOURNAL for October, 1902, p. 1323; and October, 1903, p. 1150.—E.G.

†† See the JOURNAL, October, 1903, p. 1149.—E.G.

Templer's Report, with which our officers are doubtless acquainted. It gives Colonel Templer the highest praise for the great services rendered by the balloon sections.

It gives some details of the work of the balloon detachments of the several Powers engaged in the China Expeditionary Force, and says that little is to be expected from the Russian war balloons in the present war, as they are behindhand with them, while Japan had only just commenced organising this service when the war broke out.

The Report then goes into the question of travelling airships with steering gear as distinguished from captive war balloons. As a means of transport and communication it can only be used as a last resource to convey one or two persons, as was done by the besieged in Paris, 1870-71, when steering balloons were not yet made practicable. Their great value would be, of course, for reconnaissance on an extended scale. Especially during the first days of mobilisation would such reconnaissance be of important service if it could cover long distances and return quickly to its own territory. Skilled staff officers could in a short time bring back valuable observations as regards the increased number of trains travelling on certain lines, etc. Before a battle, to determine the positions of the enemy, and afterwards to ascertain the direction he has taken, such observations might be invaluable.

The Report briefly indicates the requirements a military air-ship should fulfil. In order to make head against a wind it should have a speed of 10 metres a second (about 25 miles an hour) at a height of about 1,000 metres (3,280 feet above the earth).† In order to ensure its being available for reconnaissance during about three-fourths of the day, it must have a motor speed of 16 metres (about 50 f.s.) per second, or 38 miles an hour. The radius of action of an air-ship depends on its motor speed and the duration of this. The former depends on its propelling gear, etc., the latter on its provision of means of motion, its ballast, and on the impermeability of its balloon. In reconnoitring over an enemy's frontier to watch his mobilisation, an air-ship would have to travel long distances. To observe the French strategical deployment in 1870 a German air-ship sent up from Cologne would have had to travel 1,000 kilometres (625 miles)—i.e., about 20 hours for the outward flight alone.

We may therefore consider 24 hours as the least duration of flight admissible for an air-ship without refilling. Of course, this does not exclude shorter flights in favourable weather in fortress warfare or just before a battle, etc. We are still some distance off the construction of an air-ship which can travel 65 miles and keep in motion at a height of 3,000 metres for 24 hours, but we are on the way thereto. The Report passes over the experiments of M. Santos Dumont, the Brazilian, in 1901, and since then, as belonging to *le sport* only, and it does not mention those made in England; but it says great progress has been made in Paris, and gives details of the great air-ship "*Le Jaune*," of the brothers Lebaudy, made by M. Juillot. It has a length of 87 feet, and is 32.15 feet in central cross section (it is long and cigar-shaped with pointed ends). Its capacity is 2,284 cbm. (80,580 cub. feet), and its hydrogen gas can support a weight of 2,500 kg. (nearly 2½ tons). The total weight of the air-ship, motors, platforms, etc., is

† At this height the air-ship would hardly be safe from shrapnel.—E.G.

1,580 kilos (about $19\frac{1}{2}$ cwt.); benzine, water, sand ballast, 650 kilos (about $12\frac{3}{4}$ cwt.); and 3 men, 300 kilos (660 lbs.), including their food, etc. Total weight, say, 2,530 kilos† (2 tons 12 cwt.)

Its calculated speed is 25 miles an hour. In November, 1903, it travelled 62 kilometres at a rate of 23 miles an hour. Its longest distance was 98 kilometres (61 miles), but its motive power was not then exhausted. It overcame in its last flight a force of wind of 10 metre-secs. ($22\frac{1}{4}$ miles an hour). Its impermeability is such that it remained inflated over 6 months, and was still, with a little refilling, quite buoyant.

In the spring of 1905 fresh trials will be made with this air-ship and many others which have been constructing in Paris in view of the St. Louis Exhibition will be tried also.

Colonel Renard, Chief of the Ballooning Staff in France, is said to be constructing an air-ship with a motor of 100-H.P., so we may be outpaced by the French as regards war balloons.

FIELD FORTIFICATION.

There is nothing in the Field Fortification Chapter which it seems necessary to bring to the notice of our officers. Progress in technical art necessitates advanced instruction of German Engineer officers, who have to learn in a three years' course most of what their civilian brethren give four years to, but with a careful sifting, so as to exclude what is not applicable to war. The Report mentions some discussions, however, as to the advisability of separating the military from the purely engineering (civilian) elements.

Bridging.—Tabular details are given of the Fixed Pontoons used in Belgium, Denmark, Holland, and Prussia, and of Portable Pontoons as used in Austria, Bavaria, Norway, Russia, and Sweden. In Russia it is proposed to use Motors to draw the Bridging Train Wagons. Steel is gradually superseding wood and canvas for pontoons. Mention is made of Lieutenant Poljanski's portable aluminium cylindrical hollow casks, constructed with airtight covers, parts of which can be carried rolled up in the tent canvas, poles, etc., and put together to form light bridges for the crossing of rivers by the men. Lieutenant Vogel, of the German Engineers, has also designed a somewhat similar light-bridging apparatus, which has floating piers of a stout India-rubber substance. These can, when inflated, be rolled round the soldier's knapsack. Boards as road bearers, chasses, etc., are carried by others, and these can be fitted on to form a light foot bridge. Attention is invited to many articles in the *Kriegstechnische Zeitschrift*, 1903, to Von Brunner's *Feldbefestigung* (Seidel, Vienna, 8th edition, 1904); Weidner's "Value of Field Fortifications in the Boer War," etc., reprint from *Militär-Wochenblatt* (Mittler), etc.

PERMANENT FORTIFICATION.

As usual, the Report deals very fully with the progress made in *Permanent Fortification*, and we regret our space does not enable us to enter upon this valuable chapter. Our Engineers, Artillerymen, and Naval officers would do well to study it in the original, as ex-

† I give these figures as they appear in the original, calculating their English equivalents.—E.G.

tracts are given with short comments from such recent works as:—FROBENIUS, *Die heutige Panzerbefestigung*, Berlin (A. Bath.), 1903; *Kampf mit Festigungsartillerie*, 1903 (Mittler); MASALIK and LANGER, *Der Kampf um Gürtelfestungen*, Wien, 1903 (Seidel und Sohn); *Der Küstenkrieg*, Mieliehofer, Wien, 1903 (Seidel); *Biserta als Festung und Flottenstützpunkt* (Militär-Wochenblatt, 88, 89, 1903); *Gibraltar* (Militär-Wochenblatt, 116, 1903); STAVENHAGEN, *Erd oder Panzerschutz* (Marine Rundschau, 2, 1903); WÖLKI, *Wert der Stadtbefestigungen* (Kriegstechnische Zeitschrift, 3, 1903).

The section on COAST DEFENCE† is a particularly good one, and the principles of attack and defence as therein set forth have been and are being carried out at Port Arthur in the present war. The hard task of the attack by bombardment, owing to the difficulty of replacing heavy ammunition, the necessity for keeping the battle-ships at a distance of nearly six miles from the forts, and in all cases where possible for a simultaneous attack being carried on by the land forces from the land side are dwelt on. On the whole question the opinion is expressed that the defence has gained more than the attack of late in coast defence.

The question as to whether the *enceinte* of a fortress which is surrounded by modern detached forts is indispensable is discussed, the citizens of Antwerp, for instance, being desirous of doing away with it, though their late famous engineer, General Brialmont, was against this course. The general opinion seems to be that though a strong, elaborate, expensive *enceinte* is not now required, yet a surrounding defence of some sort, which shall be proof against assault by surprise, is required.

The Report as usual notices changes in existing fortifications, etc., in the various States. Alterations in **Bulgaria** and **France** are given. The general plan of the fortification of **Biserta** is given, the batteries, etc., being enumerated in detail, though their armament is not given. The progress of coast defence in **Great Britain** is followed, followed, especially that in the Firth of Forth. The Forth and Clyde Canal, which is 57 kilom. (nearly 36 miles) long, needs only widening, it says, to establish direct communication with the Clyde, which is indicated, it is considered, by the reconstruction of certain old works and the rearmament of others. The Medway additional work is also glanced at. In **Germany** the fortification of Basel is mentioned, while certain others in Coblenz and Wesel are reported as to be given up, and the *enceinte* of Spandau, Glogau, and Thorn are being destroyed.

In **Italy** the strengthening and rearmament of the old Fort of Bard, so famous in the Napoleonic Wars, is mentioned, and the Ventimiglia frontier group; also the strengthening of Genoa. The rearrangements of the Simplon defences, necessitated by the opening of that tunnel, is briefly touched on. Taranto, to which place the Arsenal at Naples was moved in 1895, has then, the Report remarks,

† The writer makes some curious remarks as to "the details of all "coast defences constructed in peace, being well known, as foreign officers "would, of course, take advantage of the hospitality afforded them to "thoroughly inform themselves of their condition, etc. This was done at "the opening of the Kaiser Wilhelm Canal, in regard to the Kiel Harbour "defences." From what I know of German officers, I think they are exceedingly well able to take care of themselves in this respect.—E.G.

been considerably strengthened, owing to the importance the proximity of Biserta, in the occupation of France, gives. It then describes its batteries and their armaments.

MILITARY COMMUNICATIONS OF THE PRESENT DAY (1903).

Some details of the progress of the Manchurian Railway in 1903 are given.

Great progress in motors of all kinds is reported during the year, especially as regards motor self-driving cars and carriages, which are now used by Generals and Staff in all Armies. Of great military importance is the use of motor bicycles for the rapid transmission of messages during field operations. These can be used on field footpaths, and can rush past troops marching along narrow roads without halting them, which four-wheeled motor cars cannot do. One quart of benzine suffices for 19 miles of route, so that a distance of 152 miles can be covered with the expenditure of 2 gallons of benzine.

The desire in France and Germany to use alcohol as motor generating power has hitherto proved a failure, and now benzine has come into general use.

The £1,000 prize for Traction Engines was won in England by the firm R. Hornsley and Sons, Ltd., of Grantham, with an explosive-motor engine which fulfilled all the required conditions. It drew 25 tons up gradients of 1 in 18 at a speed of 3 miles an hour, and covered 40 miles without having to renew its supply of motor-generating material.

Only two competed in Germany, the General Electric Co., of Berlin, and the Siemens-Schuckert Works, in Berlin and Nuremberg. Neither fulfilled quite the conditions imposed. The Siemens engine drove all 4 wheels by electricity, generated by a Daimler explosive motor of alcohol. This failed owing to its having been originally constructed for benzine. The Siemens electric engine was in all other respects very carefully and excellently made. From these trials the ordinary steam engine seems more suited for heavy traction than the explosive-motors, owing to its greater simplicity of construction and the certainty of its traction power, which can easily be increased for special occasions; but the necessity for more frequently renewing its fuel must be taken into consideration.

Telegraph and Telephone Service.—The field telegraph, and especially the telephone service, continues to make rapid progress in Germany. Every Cavalry regiment has now a special telegraph wagon with its Regimental Transport, and its own small telegraph detachment. The abolition of the folding-boat wagons and the establishment of the Cavalry light bridging train enabled this to be done without increasing the length of the Regimental Transport.

Wireless Telegraphy† continues to progress, but at present no certain means has been discovered of preventing your own messages being mixed up with others, the receiver being so sensitive. The Report goes into details explaining this, which are too technical to be transcribed here.

† Whether this word be scientifically correct or not, it is in such general use that I think it best to continue to employ it for *Funkentelegraphie*, etc., see the JOURNAL, October, 1903, p. 1153.—E.G.

The distances which it says messages can be conveyed fully and with certainty are:—Across water, 200 kilometres (125 miles); and overland, 100 kilometres (62 miles). That is with normal station apparatus and Morse telegraph writer. With special hearing apparatus greater distances can be accomplished.

Belgium, England, Egypt use the *Marconi* system. Argentina, Austria-Hungary, Chili, Denmark, Germany, Mexico, Portugal, Sweden use the so-called "*Telefunken*" system, which is a combination of the "*Slaby-Arco*" and "*Braun-Siemen's*" systems. France, Greece, Morocco, Norway, Spain use the "*Branly-Popp*" system. Japan uses a "*de Forest*" system of its own. Australia, China, Canada, and the United States use the "*Marconi-de Forest*" system; Russia and Holland the "*Ducretet-Popoff*" systems.

The *Marconi* has 300 stations and the *Telefunken* 250.

The Report deplors this want of unity and the desire of the *Marconi* Company to establish a monopoly, by which all ships would practically be compelled to adopt its system, or dangerous consequences might ensue. On the initiative of the German Emperor a conference was held in Berlin in August, attended by representatives from Austria-Hungary, England, France, Italy, Russia, and Spain, which agreed on certain principles on which International rules regulating the use of wireless telegraphy should be framed. A further International Congress to discuss these was to be held in 1904. *Marconi*, with his giant observatories, has as yet only succeeded in sending messages with certainty 750 miles. Russia, operating on the *Telefunken* system, sent messages with certainty from St. Petersburg to Moscow (375 miles).

The development of wireless telegraphy for overland signalling made such progress last year that we may now reckon on successful telegraphic communication being established at a distance of two ordinary days' march—say, 32 miles—or, in the case of the Cavalry Divisions, exceptionally about 62 miles. In August last year, with one telegraph wagon only, it was found possible to transmit two independent messages simultaneously without their interfering one with the other. During the practices of the Wireless Telegraphy Section of the Balloon Battalion last year the solution of many fundamental questions was approached.

Several experiments were made at the Imperial Manœuvres last year in Germany. The four-horsed telegraph wagons can generally keep up with the troops on high roads. If, however, it is desirable to provide a lighter equipment for hilly country, colonial wars, etc., then two-wheeled carts, drawn by ponies, mules, or oxen, are provided. For a cart station, as it is called, five carts, each of a maximum weight of 600 kilo (nearly 11 cwt.)† Cart I. carries the transmitter and receiver apparatus; Cart II. the dynamo for the electric energy, benzine, motor, etc. Cart III. is the balloon cart, with kite, tools, and reserve material; also four gas retorts with hydrogen gas and a certain quantity of benzine and oil; Cart IV. carries a gasometer, which shall, in certain cases, such as a total absence of wind, etc., make the station independent of the cart with the hydrogen gas. To make the gas, sulphuric acid and iron or zinc shavings are carried. Cart V. is for the baggage of the detachment, their portion of "iron rations,"

† This is a very heavy weight for one or even two animals in a hilly country.—E.G.

and a full ration for the teams. These carts have iron axles, and are driven from the box, which will seat the driver and one other man. The draught is by one horse or mule in shafts under ordinary circumstances.

The detachment of a "station" is 2 officers, 2 non-commissioned officers, and 8 men. At the manœuvres the "cart station" attached to the Balloon Battalion did remarkably good service. No attempt has yet been made in Germany to use motors for these carts, etc. Marconi has made experiments with such, but no reports regarding these are to hand.

The Report goes into details, for which we have no space, of the use of wireless telegraphy in fortress warfare.

MILITARY LITERATURE.

The following are a few of the voluminous military works published in 1903, and brought to notice in the Reports:—

General. Military History, Etc.

Kriegsgeschichtliche Einzelheiten (Episodes of Military History). Vols. 32-33. The South African War, 1899-1902. Published by Section I. (historical) of the German General Staff—Colenso-Magersfontein, etc.†
Studien zur Kriegsgeschichte und Taktik. Vol. II. In Part I, by the same authors, *Breaking off Actions* is discussed, six examples being given to show how this is done. The second part treats of *Der Schlachterfolg* ("Success in Battle, and How it is Attained"). Some of Frederick the Great's, Napoleon's, and von Moltke's battles are used in illustration.

The Universal History of War. By L. FROBENIUS. Book II. (Hanover, 1903.) This is the continuation of Lieut.-Colonel H. Frobenius' "History of War on Land" briefly epitomised, but thoroughly and comprehensively done and richly illustrated.

L'esprit de la Guerre Moderne. By Général BONNAL. Is intended to comprise the period from the time of Frederick the Great down to the present date. The two volumes as yet published, however, are "*Sadowa*" and "*Fräschweiler*." "*De Rosbach à Ulm*" and "*La Manœuvre de Jéna*" have now appeared. "*Landshut*," "*Wilna*," "*St. Privat*," and "*Hericourt*" are to form the next volumes. "The work is not the result of earnest study, and the sources from which its information is derived have been utilised without apparent inquiry as to their authenticity." Such is the opinion of Major Kunz, a reliable author on the period.

† See the JOURNAL, May, 1904, p. 586.—E.G.

**General Military
History, Etc.,
contd.**

Kritische Beiträge zu Napoleon's Feldzügen.

By KARL BLEIBTREU. (Vienna.) Is based upon the real occurrences at Aspern and Wagram, 1809, and upon statistics.

The second volume of the Oxford Professor C. OMAN'S celebrated work, *The Peninsular War*, including the events from January to September, 1809, has appeared.

Vorgeschichte der Schlacht bei Belle Alliance, "Wellington," by DR. VON PFLUGK-HARTUNG, seeks to do justice to all parties.

The remarkable *Studien über Kriegführung* ("Studies of the Conduct of War"), based on the campaign in Virginia in the American War of Secession, by Major Baron v. FREYTAG-LOVINGHOVEN, are concluded in a third volume, which embraces Atlanta, Spottsylvania, Petersburg, Savannah—the end. (Berlin. M.4.)

Colonel A. STROBB has published in his *Aus dem Kriege des Jahres 1866* an excellent account of the battle of Königgrätz, in addition to his former writings on that war. (Vienna. M.3.)

The French General Staff Work of the War of 1870-71 is now published in two parts. It is brought down to the 14th August, 1870. "Borny" as far as the operations of the Army of the Rhine are concerned, and those of the Army of the North, the latter in three vols., the first "*Villers-Bretonneux*," the second, "*Pont-Noyelles*," the third "*Bapaume*," which takes the account to the 13th January, 1871; a fourth volume is to complete this part of the narrative.

Colonel PALAT, who writes under the name of P. LEHAUTCOURT, has contributed in a third volume "*Wissembourg*" *Fräeschwiller-Spicheren* much that is new from hitherto untapped sources with his wonted skill. (Paris. F. 7.)

Kriegsgeschichtliche Beispiele, 1870-71. Vols. 14, 15, 16, *The Battle of Wörth*, gives examples of Infantry Attack ending with *Fräeschweiler*. By Major KUNZ.

Von der Donau bis Plevna. By GENERAL THILO VON TROTHA.† Criticises the events of the Russo-Turkish War of 1877.

War in Practice. By Major BADEN-POWELL. Tactical Lessons, 1899-1902. (London. M.6.)

† Now commanding in German S. W. Africa, against the Herreros.—E.G.

Biography, Etc. — Gottfried Graf von Haeseler.

Drei und fünfzig Jahre aus einem bewegten Leben.
Is the 1st Vol. of the recollections of Baron WATTMANN-MAELCAMP-BEAULIEU, Colonel of the Austrian Engineers, Cavalry, and Staff. (Vienna, M. 5.)

Mémoires de Langeron. Général Russe. 1792-1814.

Un Siècle de Batailles. By Le Général MELLINET. 1798-1843. Pictures the events of a soldier's adventurous life from the Pyrenees to Waterloo; from La Vendée to Algeria.

The Story of a Soldier's Life. By Viscount WOLSELEY, Field-Marshal.

Forty-one Years in India. By Field-Marshal Lord ROBERTS, V.C., K.G., etc. (German translation. M. 12.)

Field-Marshal Sir DONALD STEWART.

Field-Marshal JOHN COLBORN, Lord SEATON.

Notes and Reminiscences. By Colonel BASIL JACKSON.

Einzeldarstellungen. 1866. By F. REGENSBURG. Vol. 1, *Königgrätz.* Vol. 2, *Von Dresden bis Münchengrätz.*

Souvenirs de l'Annam et du Tonkin. By le Capitaine MASSAN. (Paris. F. 5.)

Regimental and other Histories.

These are so numerous that a selection is here impracticable. One of the most complete is *Übersicht der Hannoverischen Armee, 1617 bis 1866.* By General v. SICHART. (Hanover. M. 6.)

Die Generale der Königlichen-Hannoverischen Armee. By Colonel v. POTEN. (Berlin. M. 150.) Should be read with it.

Ein Beitrag zur historischen Waffenkunde. (Frankfort. M. 45.) Is a valuable scientific treatise on armour, arms, etc., by Dr. J. VON HEFNER-ALTENEK. Illustrated by 100 engravings. Period, beginning of Middle Ages to end of 17th Century.

PART III.**CONTEMPORARY MILITARY HISTORY.**

The historical section for 1903 epitomises the following:—

1. Report of the military events in the German Colonies in East Africa, Togo, South-West Africa, the Cameroons, New Guinea, the Caroline Islands, the Mariane Islands, the Marshal Islands, and Samoa.
2. Report of the insurrection in the Balkans.
3. The war in Somaliland from 1899 to 1903.

This section is not quite as interesting as usual. The tragic events of the *Herrero* rising in German South-West Africa could not be included in the Reports for 1903, but will in those for 1904. The organisation of the rebel bands in the *Balkans* is well described, and the mobilisation of the IIIrd Turkish Army Corps is detailed, so that with the Organisation Table of the Turkish Army given in the first part of the book the working of the Turkish Forces can be very well followed. The various engagements with the rebels in 1903 are briefly touched on, and the operations of Marshal Omer Ruschdi Pascha, who had been Edhem Pascha's Chief of the Staff in 1897, are lightly sketched. Our space does not admit of these being translated.

The operations in Somaliland are already well known to our officers.

MILITARY OBITUARY.

Lieut.-General Henri A. Brialmont.—This celebrated engineer was the son of an old officer of Napoleon I., who died as a Belgian general. Educated at the Military School in Brussels, he passed out in 1843. He was Secretary to General Chazal, Minister of War, in 1848. In 1855, promoted captain, General Staff of the Belgian Army. In 1855 he designed the fortifications of Antwerp. These were not approved or adopted till General v. Todleben, the celebrated Russian Engineer, declared his designs the best he had seen. They were opposed to the Vauban system and more after the polygonal system of Montalembert. Antwerp came to be considered as a masterpiece of modern fortification. After 1870 an advanced line of forts was added. In December, 1865, King Leopold II. made him his Aide-de-Camp. In 1868 he became Director of Military Operations in the Belgian War Office, in 1874 Major-General, in 1875 Inspector-General of the Corps of Engineers, and in 1877 Lieut.-General. He was the originator of the Line of the Meuse Works, which were to serve as bridge-heads and supporting points against any invading Army till the arrival of the troops of the Powers guaranteeing the neutrality of Belgium. His reputation as an Engineer caused his employment by foreign States—Roumania, Turkey, Greece, and Bulgaria. In 1883 fortified Bucharest, capital of Roumania. He left the Service in 1892, after being elected to the House of Representatives. He laboured hard for the introduction of Universal Service in Belgium, and strongly upheld the necessity of preserving Antwerp, the *enceinte* of which was threatened with dismantlement.

He was an indefatigable author, not only of military and technical works, but in political and historical spheres. His well-known "*Life of the Duke of Wellington*" (Brussels, 1856-57),† which is more a history of the war of the European Powers against Napoleon than a biography. He was an original founder of the *Journal de l'Armée Belge* in 1850.

Sir John Lintorn Simmons.—The Report gives a very brief account of the career of the late Field-Marshal, which, it says, is characteristic of the many-sided nature of the services of British officers.

† This excellent work was written in collaboration with the Chaplain-General L. R. Greig, but Brialmont took the lion's share of the Military History part.—E.G.

Major Justus Sheibert.—This officer, born at Stettin, in 1831, and died at Gross-Lichterfeld in 1903, was, perhaps, better known as a military writer than as a soldier. Yet he had a distinguished career of active service, for, entering the Army in 1849, he served in the Danish War of 1864, the Austrian War of 1866, and the Franco-German War up to Wörth, where he was, however, so severely wounded that he was not fit for service again till 1872, when he was brought in as Major again and did good service as an Engineer in Posen, Minden, and Cüstrin. He left the Service in 1880 to take up the editorship of *Die Post aus dem Riesengebirge*, and later he was an active collaborator on the Staff of the *Kreuz Zeitung*, which work he continued till his death. His "*Mit Schwert und Feder*" gives a lively account of his experiences.

Prince A. Rihito Komatsu.—This Japanese Field-Marshal, born at Kioto in 1846, died at Tokio in 1903. He was a prominent co-operator in the Revolution of Japan. In 1867 he defeated the Shogun rebel troops, and in 1869 was made War Minister. In 1871 he was sent to Europe on a diplomatic mission. He here saw how even Princes must go through the mill; so he himself, on his return, set the example in his own country, and entered the Army as a sub-lieutenant. In 1877 he had risen to the command of a Brigade, and defeated the Satsuma rebels under Saigo Takimiri. In 1879 he was appointed Lieut.-General and Commander of the Guard. In the China War he succeeded to the Command-in-Chief, but as he took up the command in 1895 the enemy made peace.

Lieut.-General Tamura.—A highly-valued Japanese Staff Officer, was five years in Germany. Then he was employed in re-organising the Japanese Army under Marshal Yamagata. He commanded an Infantry Regiment in the war against China, and was Military Attaché in Germany from 1896 to 1899. Promoted Major-General in 1902, he was made Second Chief of the General Staff of the Japanese Army, and was promoted on his death bed in September, 1903, to the rank of Lieut.-General.

Major-General von Springer.—This well-known military writer died at Troppau on the 31st March, 1903. He entered the Austrian Service from the Vienna Military Academy in 1864, and took part in the war of 1866. In 1876 he was appointed to the Staff. In 1892 he became Lieut.-Colonel, and three years after Colonel. In 1900 Brigadier-General. In 1877 he published "*The Cossacks*," thereafter "*The Staff Officer's Handbook*," which went through many editions; then "*The Russo-Turkish War of 1877-8 in Europe*," which is the most comprehensive and reliable work on that campaign. He contributed also much towards periodical literature till shortly before his death.

THE BRITISH CAVALRY: SOME SUGGESTIONS.

*By Captain E. M. J. MOLYNEUX, D.S.O.,
12th Cavalry (Indian Army).*

TWO main defects are generally admitted to exist in the present system under which officers are supplied to regiments of British cavalry, viz.:—

1. The most is not at present made of the opportunities for the development of the unrivalled material available, so as to produce the best practical results.

2. The field of selection for the supply of officers to the British cavalry is unduly narrowed by the considerable private income which officers, accepting commissions in that service, require to meet the many and varied calls upon their purses, the prospect of such expenditure causing many, who would otherwise make excellent officers, to shrink from the pecuniary obligations involved. The cavalry has thus to be content, in some instances, to take young men as officers who have little or nothing to qualify them for such a career beyond the command of a considerable income, and who obtain their commissions owing to the lack of other candidates, in spite of the fact that they are not, either intellectually or physically, the men whom the military authorities are desirous of seeing join that arm of the Service.

The dearth of candidates for cavalry commissions of late years is well known to the authorities and to the public. There are certain cheery optimists who would have us believe that we are all the time really getting the best men available, on the ground that the man who has passed highest in an examination is not necessarily the man required, as a strong physique, a liking for horses and everything pertaining to them, nerve, eyesight, capacity for command, and other most essential qualifications for the cavalry officer are not and cannot be tested in the examination hall. A little further on I propose a system by which some of these qualifications should be to a certain extent insured before the candidate is posted to a regiment. Meanwhile, it is only necessary to point out that a service, to enter which there is little competition, from whatever cause it may arise, is not on the way to secure as good men as it would, did a healthy competition exist.

The connection between the two defects in question is too obvious to require demonstration. I will not delay the reader by going over ground so often covered already, but will proceed to the discussion of certain specific proposals.

I.

I would suggest, in the first place, the establishment of a special Training School for cavalry officers, to which all cadets gazetted to the cavalry should be sent straight from Sandhurst, where they would undergo a twelve months' special course of instruction before joining their regiments, their commissions bearing the date they were

gazetted from Sandhurst, so as not to place them at any disadvantage as compared with officers of line regiments leaving the college at the same time.

Revolutionary as such a project may appear at first sight, it is one which already prevails, and works in a most satisfactory manner, in the officering of the Royal Engineers. The cadets at Woolwich, whether destined for artillery or engineers, are all educated together in the different subjects in which it is advisable that they should have training in common. Then, when the young gunner goes off to join his battery, the sapper is sent to Chatham to undergo another year's course in order to acquire proficiency in his own particular technical subjects. Similarly, at Sandhurst, cavalry and infantry cadets are trained together, much of their training being of course applicable to either service, such as topography, tactics, military history, law, organisation, riding, gymnastics, and musketry. The reason that the system pursued with Royal Engineers has never been applied to the cavalry is probably that it has never been admitted by the public—except in time of war—that the cavalry is, or rather should be, a highly specialised arm, whose functions in time of war are certainly not less important, and hardly require less training for their proper performance, than those of the sapper.

In times gone by a cavalry commission was looked upon as affording a pleasant occupation for a young man of wealth and leisure, carrying with it the right to wear many various and becoming uniforms when engaged in duties not too exacting in peace, and in which a much larger amount of free time was ensured than would be possible for a man anxious to succeed in any other profession. Force of conservatism causes the general public to expect the cavalry officer to be a leisured and gilded ornament of society until the outbreak of war, when it becomes exceedingly wroth with him if it finds there is any one of his many duties in which he is not a proficient. Now, the performance of cavalry duties in the field cannot be ensured by any amount of theoretical study. It would be just as reasonable to expect a man to go to the wickets and make a score after he had carefully studied the works of Grace, Ranjitsinghji, Fry, or other distinguished cricketers, as to expect the cavalry officer to be able at once to fulfil all his field duties without plenty of training and practice in the field. No mere reading will make a good cavalry officer, any more than a good cricketer can be made by reading up a book on the subject of cricket, although in both cases theoretical study of good models is of value.

The proposal to put cavalry officers through a special course of training before joining would have the following advantages, amongst others:—

Those unsuited to the cavalry service would be weeded out before joining their regiments, to the great benefit, not only of the cavalry, but of their own pockets or the pockets of their parents or guardians, as it is proposed that only those should be allowed to join regiments who were found thoroughly fitted for it in every way at the end of a year at the Special Cavalry School; nor should any of them be required to purchase uniforms, horses, or outfit until after leaving the school. I will return later to the question of the course proposed. Under the present system the number of resignations of their commissions by young cavalry officers—all of whom have spent not less than £350 or £400, and often much more, upon uniforms, horses, and

general outfit—has amounted at times to almost a national scandal, and has been largely responsible for parents and guardians of moderate means refusing to entertain the idea of the cavalry as a career for their sons or wards, no matter how desirous of a cavalry commission might be the candidate for whom they were responsible. For those who leave the cavalry service after a very short experience of it are by no means only those whose means are insufficient to support the expenses involved; there are many who are constitutionally unfitted for it, but do not discover the fact until after they have actually joined. At the end of a year at the Cavalry School one of two things must happen: either the candidate is found to be unsuited for the cavalry, and is transferred accordingly to the line without loss of time, money, or self-respect, or else takes his place in a regiment, adequately equipped, in all but experience, for the duties of a cavalry officer, instead of joining with far less knowledge of horses and cavalry work generally than the troopers under his command, as is far too often the case at present, since on joining his regiment he has everything connected with cavalry still to learn. For a considerable period after joining he is usually not much use, since he knows nothing of his work, and much might be taught him at a Cavalry School which he now is left to acquire slowly and in a haphazard way. The most powerful incentive to effort—that of competition—is usually wholly wanting in a regiment, whereas it should be very powerful in a school in which all the students vied with one another to leave with the best record of professional acquirements. Although the more senior officers, under whom the newly-joined subaltern is placed to learn his work, will help him to learn it, they have a good deal else to do, and are not professional instructors with a thorough plan for teaching their subalterns systematically. In a Cavalry School the course would be systematic, and more uniformity of knowledge gained by all, to the great advantage of the Service. The great inconvenience of having to detach young officers to go through veterinary and other courses after joining would also be reduced to a minimum.

The Special Cavalry School would have to be in the vicinity of Aldershot or some other large military garrison where mounted troops are quartered in considerable numbers, for the twofold reason that the students would require a large veterinary hospital for the practical study of that very important subject, and because they would profit by being allowed to take part, as officers' patrols, etc., on field days. A course of one year should be sufficient to ground them in their professional duties and to weed out the inefficient. The latter might make good officers in other branches. The cadets would require little uniform in addition to their Sandhurst kit; stout riding breeches, gaiters, and shooting boots should be almost sufficient. The school should accommodate 35 or 40 only, not more than 15 or 20 subalterns being required half-yearly for cavalry. A horse would be required for each cadet and for the instructional staff, and some grooms—soldiers or ex-soldiers. A commandant (a most carefully-selected cavalry officer of ability and experience), an assistant commandant or adjutant, riding master, and a thoroughly reliable and practical professor of veterinary science would also be required, and such professors as may be necessary to ensure the students keeping up the study of topography, tactics, etc., might with advantage be cavalry officers of active habits, so that their services might be utilised as umpires and instructors for purely cavalry work in the field. If every student

were also required to study one European language—French, German, or Russian, as preferred—it would add to the utility of the course.

The special cavalry subjects should include, amongst others, the following:—

1. Veterinary science, both theoretical and practical. South Africa showed us how immensely important a matter it is, and also that it is an unexpectedly weak point. Opportunities for thorough study of it are not adequate later on in the cavalry officer's service, when tactics and administration take up most of his attention, not that I wish to minimise the importance of devoting the greatest attention to subjects which deal with fighting pure and simple, for fighting is the ultimate *raison d'être* of every soldier. The soldier, however, has to devote the greater part of his life not to fighting, but to the preparation for it; and that, in the case of the cavalryman, consists to a great extent in the care and training of horses. He may be in action on ten or twenty days in the course of his military life; days, it is true, of such immense importance that no pains should be spared to ensure his being able to acquit himself well on these occasions by careful peace training. But he will certainly have the health, training, and possibly also the selection of a large number of Government horses entrusted to him during some twenty-five or thirty years. In peace this duty is important; but in war the importance—as we found to our own most heavy cost in South Africa—of a thorough knowledge of horse management and veterinary science is so great that it is no exaggeration to say that, for the cavalry officer, horse management is hardly secondary even to knowledge of strategy and tactics. Given two opposing cavalry forces, equally numerous, well mounted, and well led, there can be no doubt but that the force, which knows how to keep its horses alive and fit, will have an immense advantage over that in which the effective strength is lowered by death and disease due to imperfect care and knowledge, ill-fitting saddlery, over-weighting, or improper use of food.

Even the effective horses will then be inferior in pace and endurance, from their condition being unequal to those to which they are opposed. Hitherto we have been too much content to leave veterinary knowledge to the veterinary surgeon—a system which may be made to work fairly well in peace, but which must inevitably prove most unsatisfactory and wasteful in war.

The veterinary department is necessarily a small one; during a great war not only are the cavalry scattered over a large area, out of reach of veterinary care, but the establishment of horses is so swollen that the veterinary department would be hard put to it to look after them all, even if there were nothing else to be done with the horses but to dispose them in the most convenient arrangement for superintendence. What a difference it would have made in South Africa if every cavalry officer had had a good working veterinary knowledge, which he had disseminated as far as possible amongst those under him; and if every retired cavalry officer who then came forward had sufficient knowledge to have been put in charge of a horse dépôt and been competent to treat all ordinary cases, and set the overworked veterinary staff free to look after complex cases and the general supervision of animals and stores of medicines, instruments, forage, etc. The fact that we lost some 200,000 or 300,000 animals in South Africa did not lose us the campaign, though it did undoubtedly protract it unduly and hampered our every movement,

besides adding millions to the bill; but it might well have lost us the campaign against a Power more evenly matched with us. Loss of draught and riding animals to an army means loss of mobility and striking power, which are indispensable to the winning of battles. Without it an army is like a fleet without coal. In the next war we may not have time to ransack the ends of the earth for animals to replace those which our own ignorance has sacrificed. So I conclude that we might find it an economy in the long run to attach a veterinary professor to our Cavalry School, and to insist on every student being as well up in that subject as it is possible to make him in a single year. The examinations should mostly be practical, not done in the study.

2. Closely allied to the above is the whole question of stable management, shoeing, feeding, fitting of saddlery, ageing of horses, etc. Every officer on joining should know how to shoe a horse, pare his hoofs, etc. Some may object that it is not the business of a cavalry officer to be a veterinary surgeon, a groom, or a shoeing-smith. Neither is it the business of any man to be above his work. Just as we pass the young engineer for a year or two through the workshops, and the doctor through the hospitals, so, too, do we require to give the cavalry officer a thorough insight into the work for which he will be responsible, though his work may eventually consist in supervision rather than execution.

3. Equitation should, of course, form part of the course. It might include tent-pegging and lime-cutting for the more advanced.

4. Reconnaissance and the detached duties of cavalry. The students should parade mounted for this at least once a week, carrying feeds and rations on service scale for a whole day's continuous work in the open, the work for first term students consisting at first in the mere drill and formation employed on officers' or reconnoitring patrols, or acting as part of a cavalry screen, the instructor carefully following all the movements, so that the students may be encouraged to adapt their formations to circumstances, and make them sufficiently flexible to take the maximum advantage of natural features, and use their intelligence in so working as to expose themselves the least possible to risk of discovery or capture. Later on, as they obtain the confidence which comes from practice, they may be manoeuvred against one another as two parties or patrols, the work including the dispositions if attacked, rapid and accurate transmission of intelligence, and reports and sketches. The same student should not always be the leader of the patrol, or draughtsman, and the exercises to be varied in scope and idea, as well as progressive in nature. On return from this field-day, each cadet should be required to take his saddlery to pieces and clean it, and put it together again, after having groomed his horse, at any rate during his first term. Such "drudgery" might keep some men from joining the cavalry; but not, I think, those who would make the best officers.

The above is meant to outline the principal subjects only; it is not within the scope of a magazine article to follow the course more in detail.

II.

The second part of our subject is far more delicate to handle. To check too costly a scale of living is difficult without undue interference, and sumptuary laws at all times have usually proved more vexatious than effective. And in the first place I would deprecate

the incessant rummaging in the uniform case, which is the delight of some well-meaning Army reformers, who think they can solve the whole question by ripping a bit of gold lace off an officer's waist-coat or giving him a different shaped collar. Every such change means usually the discarding of some article of uniform which would last a long time, and so is an additional initial expense—a severance with the past associations of the uniform—and exactly contrary to the intention of the promoter of the change. A further diminution of the attractions of the Service uniform has now been reduced to the minimum: a handsome full dress, a plain working dress, and a dinner dress. No useful purpose would be served by further changes in uniform.

The expenses of the cavalry officer seem to be capable of classification under two main heads: social expenses and expenses connected with sport. In regard to the first, it is neither desirable nor possible to prevent a rich man spending his money in any way he may please. Officers cannot be expected to submit to restrictions on their personal liberty which would be tolerated by no other body of men in a country where we are unaccustomed to such interference, and jealous of it. Something can, however, be done to reduce the obligatory social expenses to a uniform level throughout the British cavalry, by the system which regulates regimental expenses in the Indian cavalry. In the latter Service a system prevails, and works most satisfactorily, by which a regular sum (3 per cent. on pay and allowances) is deducted each month from each officer and put to the credit of the "Entertainment Fund." No officer can be called on for any contribution—ball, gymkhana, dinner, or anything else—beyond what is covered by the above deduction. If it is wished to give a dance, by all means let it be done, if there is the money in the fund; if not, then they must wait until it accumulates. Every man knows exactly where he is over his expenses; there is no check whatever on any man who wishes to spend money in his own name on social entertainments. He may have a dozen guests to dinner or give any entertainment himself; but he cannot ask anyone else to contribute towards it. I do not say that 3 per cent. would be a sufficient proportion to deduct from the pay of officers of the British cavalry, from whom so much is expected; but I do think that it should be on some fixed basis of the kind, so that it should be out of the power of regiments to live at a rate of expenditure ruinous to many of their officers, in an endeavour, possibly, to outshine others. There is no reason why the commanding officer should not be required to certify each month that to the best of his belief no expenditure had been called for from his officers, either directly or indirectly, beyond that sanctioned as above. He could sign it with all the other monthly certificates.

If hard condition, nerve, judgment, horsemanship, and activity of mind and body be desirable qualities in our cavalry officers, and if it be conceded that certain sports tend to encourage and develop such qualities, to an extent with which no system of parade riding can ever compete, then it follows that the utmost should be done to encourage officers to spend their spare time in hunting, polo, and similar pastimes, where they will not only amuse themselves, but also keep themselves fittest for the field duties of their profession. Fortunately for their country, many officers are to be found in our cavalry who ask nothing better than to be allowed to spend their

spare hours in this way, instead of swaggering through the streets and public places in a tight-fitting uniform, as one may see any day on the Continent, an example which some short-sighted critics would like to see followed by officers in our own Army. Were the expenses connected with such sports less prohibitive, there should be no difficulty in recruiting the commissioned ranks of the cavalry entirely from such excellent material.

Another fact, equally patent, is that in time of war the number of trained horses and ponies, as a reserve for our cavalry and mounted infantry, is lamentably deficient. Is there any way by which both the above deficiencies could be met: polo and hunting made cheaper for the cavalry officer, and a small reserve of the most excellent kind created for the mounted men? I think that there is a way, and that it could be made to work satisfactorily both to the officer and to Government. The latter, in time of war, has to buy up, at far over market value, animals of the quality of which it has no guarantee beyond the purchasing officer's inspection, and which are usually insufficiently trained to stand fire, and often unpractised in going across country. Government could, I think, form a useful little mounted infantry reserve of ponies, which would be available at a fixed price on the calling out of the reserves for service, if it would make it worth the while of cavalry officers to train and keep up such a reserve. Government already has such a system, which was of incalculable value in South Africa, by which the horses of the omnibus companies were retained at a small fee. Is not the officer equally deserving of encouragement to do this? More so, I think, if he can bring up an animal in the pink of condition for immediate service, trained to stand fire and go over jumps. I would therefore suggest that Government should issue feed, fodder, and bedding, with stabling, to ponies of the "Mounted Infantry Reserve," as it already issues supplies to the thousands of chargers and animals of all sorts in its employment. That would enable each cavalry officer to keep a couple of polo ponies free of charge, especially if he were allowed the services of an extra soldier groom, who would look after the ponies in addition to performing his own parade duties, being excused guards and fatigues while so employed. The ponies might be passed as fit for the Service when the officer had trained them, and they could stand fire and go over the regimental jumps. Some blank cartridge, fired at first at a distance, gradually nearer as the pony got used to it, finally close beside it, would be required, more or less of it, according to the temper of the animal. It might be further accustomed to fire by being made to stand close behind the firing line during the firing of the annual courses of musketry on the rifle range, as is done with all the troop horses in the Indian cavalry. A committee, consisting of three of the senior officers, might pass the ponies, when they would be duly registered in the Mounted Infantry Reserve, a register being kept regimentally for the purpose, like the existing register of officers' chargers. The Inspector-General of Cavalry and other inspecting officers might also inspect them. The ponies to be purchased either by individual officers for their own use, or under regimental arrangements, and to be available for polo and to be looked on in every way as the property of the officer who owned and had paid for them, but passing to Government at a fixed price the moment the reserves were called out for service. Cavalry officers would thus keep up a reserve, splendid in quality though

limited in numbers, for Government, whilst at the same time obtaining their polo for very little beyond the original outlay on a raw pony. Some regiments might have as many as 30 or 40 such ponies, others less, according to the amount of energy and sporting tastes of the officers, and a similar arrangement might possibly be made for keeping an extra hunter.

There is one important question, however, which would have to be solved before we can assume that the above scheme would be a success: The market value of a trained polo pony is, on an average—at least so far as tournament ponies are concerned—a good deal higher than anything that Government could reasonably be expected to pay for as mounted infantry chargers. In the first place, however, there is no question of officers being compelled to register their most valuable animals, nor indeed any of them; in the second place, the scheme outlined above might possibly have a marked effect in reducing the price of polo ponies of the second order, not quite up to tournament form, but quite good enough for practice and for regimental games. In the Indian cavalry, where regimental animals are regimental property, the farriers, 16 in number, are mounted on ponies of polo height, which in many regiments the C.O. allows to be played at polo. As the average price paid for such ponies is about £10, they cannot be expected to be up to first-class tournament form, though some turn out good enough for tournaments. In my own regiment, the team of native officers, which was for several years unbeaten in the Punjab Tournament, and included Heera Singh, well known by reputation to military polo players, was to a great extent mounted on farriers' ponies.

But even granted that a supply of tournament ponies could not be kept up in a regiment under the scheme suggested, there can be no doubt but that a supply of passably good ponies kept free of charge would enable many men to enjoy regimental polo who cannot now afford to do so, except in India or South Africa. After all, what we have to aim at is to distribute the advantage as widely as possible, rather than to cater for the chosen few who represent their regiments at an annual tournament. In polo as in cricket, football, or any other game, a high standard of excellence cannot be kept up without keen competition. If the competition be one of skill and horsemanship rather than of wealth, then it is on the right lines; and I fancy that the whole tendency of the scheme would be to give the advantage in tournaments to those who were good judges of horse-flesh and had the best idea how to train and condition raw animals, and were moreover willing to devote their spare time to doing so. In the case of young officers of the right sort, there is a good deal of spare physical energy left unexpended when their day's regimental work is over. It is better that such energy should find a healthy outlet in manly sport than be left to find an unhealthy one. The more our young cavalry officers play polo the better horsemen they become, and better horsemasters, better judges of horse-flesh, and stronger, tougher, harder men into the bargain.

This article lays no claim to finality, but rather aims at putting forward certain suggestions which the writer feels would be advantageous to the British cavalry, in which he served for some years. If it should ever lead to any of these ideas being taken up and put into practice, either as they stand or in some modified form, it will have fulfilled the aim of its author.

THE DESIRABILITY OF THE ACQUIREMENT
BY INFANTRY OFFICERS, ESPECIALLY OF
THE HIGHER RANKS, OF A MORE IN-
TELLIGENT KNOWLEDGE OF THE USE
OF FIELD ARTILLERY THAN THEY
GENERALLY POSSESS.

By Major C. O. HEAD, R.F.A.

IT is naturally with great diffidence one ventures to make the implication enclosed in the above heading, and the writer must at once disclaim any intention of giving offence to anyone; but his personal experiences, as well as many episodes he has heard and read of as having occurred in the late war in South Africa, have convinced him that the subject is one to which more attention should be directed.

This subject would not be so important but for the fact that the British Army, through tradition, is primarily an infantry Army, and, in spite of the great movement in favour of mounted men in the South African campaign, it remains so still. That is to say, most of its higher commands are vested in infantrymen, who accordingly have the chief part in the direction of other arms as well as of their own. Divisional generals—almost always infantrymen—have under their command two brigades of artillery. In case of the division being split into brigades, each brigade would probably have attached to it a brigade of artillery, which would come under the orders of the brigadier — again usually an infantryman. The relationship between guns and infantry is so close that there is no doubt that this system is a sound one; but a necessary part of it is that the commanders should be equally conversant with the use of both arms, and not merely experts in one of them.

It may be wondered that a nation so devoted to horseflesh as ours should set less store, comparatively, on its mounted troops than is the case in many foreign Armies; but the answer lies in the extreme conservatism of the Army, which has preserved its fundamental ideas from the time when the horse had not attained to the cult in England under which he now exists. The ascendancy of the foot-soldier is of very long standing, and its existence can be easily understood. In our earlier days our pikemen and archers did worthy service, and they succeeded, by their defeats of French and Spanish horse, in firmly implanting in the minds of our ancestors an absolute belief in the superiority of the foot-soldier. The doughty deeds of Cromwell's Ironsides considerably shook this belief, which, however, under the Restoration, grew again and soon prevailed. Once

more it was slightly shaken by the telling results which the genius of Marlborough effected by the expert use of his horse soldiers; but with his infantry equally well handled and successful, their relative positions in the popular estimation were but little altered. Complete belief, however, in the superiority of the foot-soldier was finally established in the long struggle with Napoleon. Wellington, unlike his great antagonist, relied almost entirely on his infantry, and his conduct was usually justified by the gallantry and self-sacrifice with which it extricated him from many difficulties. He made little and indifferent use of his artillery, and was but little more enterprising or successful in the employment of his cavalry. Possibly the want of completeness and small results of many of his battles were due to these facts; and his victories compare unfavourably in these respects with the brilliant achievements of Napoleon—a master of all the fighting arms. However that may be, the British infantry emerged from the long contest with the glorious reputation of being the best in Europe, while their comrades of the other arms could hardly lay claim to a similar distinction. Naturally, therefore, the pre-eminence of the foot-soldier was more than ever accentuated, while the other arms were looked upon more as ornamental adjuncts than as useful allies. Almost all the higher commands in the Army were allotted to infantrymen, while the senior officers of the other arms were rarely permitted a command outside their own particular branch of the Service.

Now there is little doubt that the relative importance of the horse and gun, as compared with the man on foot, has considerably increased in modern times; but it cannot be said that the military "status" of their commanders has risen in quite the same proportion. As it was after 1815, so now infantry officers get most of the higher commands, though not quite to the same extent as formerly. A limited number of the men of all arms attain to general officer's rank through fortune or merit; but of those that have struggled on to it by natural promotion, the immense majority are infantrymen.

A general, as his name implies, should be an adept in the use and command of all arms, and the infantryman is too apt to confine his attention solely to his own arm, relying more or less on experts for the direction and employment of the others. Such a system is absolutely and dangerously wrong, and it cannot be too severely condemned. Cavalry, owing to the detached nature of its duties, may certainly be entrusted to the handling of its own commanders, general instructions being usually sufficient; but with artillery it is quite different.

An unfortunate idea has grown up in the Army that the use of field artillery is an abstruse science, to be understood only of a few, and beyond the intelligence of anyone not directly connected with it. This idea has been, somewhat mistakenly, considerably fostered by gunners themselves; but no greater mistake could be conceived. The appellation of "scientific corps" applied to field artillery is a complete misnomer. The field gun is very little, if at all, more complicated than the modern rifle, and its theory is very similar. Further, its tactics are purely a matter of common-sense, and without doubt very much simpler than those of the infantry. Consequently there is no reason whatever why the infantry officer should not study these tactics and take upon himself the responsibility of directing them.

Officers commanding a force of all arms should recognise that their artillery is part of their fighting strength, the employment of which, according as it is good or bad, may make or mar their chances of success, and that they alone are responsible for the success or failure of their commands. A divided responsibility should not be tolerated. In case of success the nominal commander rightly and actually gets all the credit; in case of reverse he should not be allowed to shuffle off the blame on to his artillery commander. Actions have been lost, or nearly so, through the injudicious handling of artillery. The guns have got entangled or been badly posted, and the whole efforts of the force have been directed to the task of extricating them. That, again, has been the fault of the supreme commander; he should have ensured that his guns were well posted, and he would not then have found himself compelled to retrieve the mistake of a subordinate. It must not be supposed that any undue interference with subordinate commanders is here advocated. Far from it; but the general principles of all arms should be thoroughly known by anyone considered qualified for a mixed command, so that any violation of these principles may be at once detected. It is further desirable that what may or may not be expected from modern guns should be clearly recognised, so as to avoid the loss of a valuable effect or an expectation of the impossible. A battery of artillery is not of the nature of a balloon or a surgical operation that can be best entrusted to an expert; it is essentially a fighting unit, and if not intelligently employed in combination with the other arms its value is considerably diminished.

The infantry officer who has had the patience to read thus far may now say: "Yes, I admit all that, but I do understand the intelligent use of artillery." Should he make such a statement, he should be firmly but politely contradicted, unless he happens to be one of the few exceptions which it is admitted do exist. The ignorance of infantry officers on the employment of artillery is astounding, and it is only equalled by their misconceptions of its power. This may seem a presumptuous statement to make of a great many distinguished officers; but it is not intended to be so, as the fact, considered as such, is only the natural corollary of placing artillery matters on a scientific pedestal. Naturally some confirmation or examples of this statement will be expected, and an attempt will be made to supply them, though as most of these examples occurred in the late war it is, for obvious reasons, impossible to particularise them.

Among many which occurred, the following general cases may be noted. Consideration was rarely given to the difficulty of replenishing ammunition, or to a wise economy of the stock in hand. Guns were expected to fire as often and for as long as the various commanders wished. A plea of scarcity of ammunition was considered to denote either obstruction or incompetence. When an army was almost starving, and had hardly sufficient transport for its food, guns were often expected to have an everlasting supply of ammunition, which could be wasted on any object, however trivial. The expense of artillery was seldom calculated. If the arm is useful, which is usually admitted, it should be carefully economised. Guns were often called into action to fire at half a dozen, or even less, flying Boers, and surprise was not infrequently manifested at the escape of the fugitives. It was apparently not understood that artillery

usually required some eight or ten rounds to find its range, and fuse accurately. Then, again, great things were hoped from the artillery "preparation," though such expectation was, it must be admitted, undoubtedly encouraged, if not engendered, by the field artillery drill-book in use before the war. The solemn bombardment of a position was thought capable of producing the most surprising results, quite independent of the fact that the enemy was strongly entrenched, or had even actually abandoned the threatened position, to return to it as soon as the bombardment should cease. Another many-instanced mismanagement of artillery was the bombardment of kopjes, which it was thought might be held by the enemy. Many splintered rocks and jagged holes bear witness to this useless waste of ammunition. Guns are not scouts, and, besides the fact of their doing the work ineffectually, the saving of one or two lives which they may possibly effect in acting as such, does not compensate for the expense and delay in employing them. War is a dangerous game, and lives must be risked when the occasion demands it.

Another idea of many commanders was that if a hostile gun opened fire, however far away, his own artillery must at once engage it. Though this gun might be firing at 10,000 yards range, and, as was usual and natural, was having practically no effect, yet he complained loudly of his own guns which were unable to reach it. If shrapnel fire could not hit men behind kopjes or buried in trenches, it was condemned as useless, and a loud cry was raised, without considering its disadvantages, for a shell possessing more material-destroying powers. What rarely seemed to occur to commanders was that artillery fire, like that of infantry, to reap a real big result requires a good target. Such can only be procured by the skilful use of all arms. A more negative result can be expected from artillery if it is merely required to occupy the enemy's attention or make them keep their heads down while the infantry advance; but then, as has been recently pointed out by the highest authority, the co-operation of the two arms should be close and well timed.

Another idea, also, it must be confessed, entertained by some artillery officers, is that the fire of guns gives a moral support to their own infantry. This fire need not necessarily be effective, nor even aimed; the noise apparently is all that is required. Surely this must be wrong! To begin with, it presupposes something nearly akin to cowardice in the infantryman, a condition of mind which he certainly does not possess to a greater extent than any of his comrades of the other arms. Would it not be better to create in him the belief that his own guns are not firing simply because it is not worth their while; but that, when they do begin, they will do so to some purpose? It is very doubtful if German, Russian, or French infantry would require this kind of "doping" support, and our men would probably require it less than any of them, were they not encouraged in it. At any rate, if this random, useless firing improves the spirit of our infantrymen, it has a still more exhilarating effect on the enemy, who is overjoyed at its poor results. No, let us work up to high standards, and not pander to weaknesses. Let us, if necessary, inform our men of the dread and anxiety caused in the allied fleets at Trafalgar when the "Victory" and her followers bore grimly down upon them without firing a shot, or of Soult's trepidation when Wellington's matchless infantry made its perilous flank march without shot of gun or rifle to

help it, between the French on one side and an impassable river on the other at Toulouse.¹

There were many unfortunate occurrences in the late war, resulting from the ignorance of the use of artillery, displayed by commanders. Gunners were often asked to do the useless or the impossible, and because they thought it their duty to point out the folly of such a proceeding, they were freely censured, with the natural result of a baneful friction. Other people, less cognisant of the power of field artillery, but willing to oblige, attempted the impossible and did the useless, so obtaining credit; but the actual result was still more futile. A gunner was even ordered to take his battery on to a position held by the enemy, in order to engage a hostile gun that, at a range of about 10,000 yards, was inflicting casualties on an infantry brigade at the rate of about one man per hour. Luckily the order was not insisted upon, or another "regrettable incident" might have taken the place of what eventually proved to be a creditable and successful action.

At peace manœuvres this lamentable ignorance is very apparent, as here there is not the correcting influence of the stern lessons of war. On one field-day one battery was adjudged to have bested another simply because it occupied the higher position of the two. The question was settled to the satisfaction of the umpires by saying it had the better "command." It was apparently not realised that the value of "command" is merely a matter of vision. As long as the target is visible low ground may be as good for a position as high ground, and guns can shoot as well up hill as down. The battery on the higher ground had its guns on a forward slope, and all its teams and waggons on the sky-line, while the battery on lower ground was tucked away in one of its folds, with its horses out of sight. These facts, however, completely escaped notice. The experiences of the rifle, if applied here, might have caused some hesitation before this decision was given. Superior command did not ensure the possession of Majuba Hill, nor did the want of it by Cronje's men in the river bed at Paardeberg diminish the number of the casualties inflicted on the British, when the latter attempted to storm this position.

How often, again, at peace manœuvres do we not see long lines of infantry advancing across quite open ground in the face of unshaken artillery—walking solemnly up a bare glacis, which, if swept by a storm of shrapnel, would provide a last resting place for the great majority of them, and an uncomfortable couch for the fortunate survivors for as long as their nerves allowed them to remain on it. When infantry officers go to see artillery practice they commonly complain of the targets as unserviceable, and when allowed to place

¹ Since writing the above, I have read the remarks of Captain Ram, the Dutch Military Attaché on the Boer side, in his "Observations on the War in South Africa," published in the JOURNAL of the R.U.S.I. for February, 1904. This officer states that the "moral" effect on the Boers of the British artillery, especially of their common and lyddite shells, was very great indeed. I cannot, however, but still think that, even if this opinion is accurate, of which I am certainly not convinced, it would be dangerous to expect the same effect to be produced on better disciplined troops. I think it is safer and wiser to calculate on a certain material or useful effect than on a doubtful moral one.

them themselves they dot them about behind every stone and in every crevice that can be found on the ground. The number of hits obtained on such targets is consequently small, and not unlike what would result from firing over a rabbit burrow; but it does not justify the absolute disregard of artillery fire which usually pertains to field-days. What is overlooked in this case is that though the material effect on the warren is probably *nil*, still the fire, by keeping the rabbits underground, would prevent their doing much damage. For no other reason should such a target be fired at.

It is, perhaps, in examinations for tactical fitness for command that the ignorance of infantry officers on artillery matters is most clearly demonstrated. Most of them refuse to have anything at all to do with the handling of this part of their commands, but rely entirely on their artillery commanders to do all that is necessary. No doubt in their state of ignorance this is the wisest thing they could do; but it cannot be repeated too often that such a system does not produce the most effective combined action. At a recent examination the candidate sat down and wrote out the most detailed orders for his infantry. He then contented himself with some verbal instructions to his cavalry, and apparently seemed satisfied that nothing more of that sort remained to be done. His artillery commander approached him and asked if there were not any orders for him. The answer was: "No, you're a gunner, and I would not presume to give orders to gunners." Though we, as a regiment, might consider this officer deserving of our sympathy for the high opinion which he presumably had of us, yet few of us would admit that such complete confidence was a sufficient qualification in a man under whose command we might some day find ourselves. It must be added that this officer did not pass his examination, though the cases of many others have proved distinctly that a knowledge of artillery matters is not a necessary requisite for success.

Enough, perhaps, has now been said on the subject, and it can only be repeated that the intention is not to give offence to anyone, but to draw attention to a matter of importance which requires amending. For the faults that have been mentioned a system is responsible, and not individuals. The infantry officer can perfectly well acquaint himself with all that is necessary of artillery action, and he should be made to do so before any guns are placed at his disposal. It is not for a moment intended that he should worry himself about details; but a few points which he might consider carefully may be recapitulated:—

1. The choice of the artillery main position is the most important. A good or bad selection may have the most beneficial or baneful consequences respectively. Besides, it is necessary to see that guns do not occupy the ground required for the deployment of the infantry, as then the fire of the former might be masked at a critical moment, or they might have to be moved, movement of guns on the battle-field being generally objectionable.
2. Care should be taken to avoid firing at impossible targets, a procedure which, besides wasting ammunition, gives confidence to the enemy.
3. The value of guns should be carefully calculated; how far it is necessary to make sacrifices to save them from

capture, or whether it might be more expedient to abandon them, a practical policy being usually adopted rather than a sentimental one, though no doubt a great deal can be said for the latter.

4. In the attack, the accurate timing and close co-operation of the artillery and infantry require careful study. One hand alone can effectively combine them, and a dual control should be avoided. The same remark applies almost equally to the defence.
5. The power of artillery, too, should be accurately known so as not to form expectations of it which cannot be realised. The merits and drawbacks of forward slopes, reverse slopes, and crest-lines, as artillery positions should be studied, as also the useful ranges of the gun and the advisability, on occasions, of pushing them within the enemy's effective musketry range.

In all these matters the advice of the artillery commander will naturally be sought, and due weight given to it; but the supreme commander must remember that his is the responsibility, and he should know enough about these matters to recognise when they are being ably managed or otherwise. No doubt some of the points that have been mentioned are still of a debateable nature, and even divide the most expert artillery minds; but till the true solutions of them are arrived at, infantry officers would do well to examine them for themselves, and in the absence of definite decisions, to form their own conclusions upon them. A little outside assistance is often very useful in clearing up doubtful problems, its advantage being that it brings to bear an open mind unhampered by traditions and prejudices, which in the new circumstances may not apply.

Unfortunately many infantry officers have been extremely doubtful of the possession of any real value by field artillery. They have recognised that it existed, and that they had got to make the best of it, though a nuisance; but they would much rather have been without it. For the benefit of such as these, if they are still of the same mind, attention might be drawn to the action on the "Mournful Monday" preceding the siege of Ladysmith; to the action at Ladysmith on the 6th of January; and to the engagement at Pieter's Hill, which finally effected the relief of the town. These are but a few instances of an intelligent use of artillery, and if carefully studied they should convince even the most sceptical that artillery, well handled, can render its side very great assistance. But all our own experiences of this sort are put completely in the shade by the brilliant results achieved by the close and intelligent co-operation of the Japanese infantry and artillery. Sufficient information of their action has, however, not yet been published to enable us to draw any conclusions from it affecting the subject of this paper.

Many instances occurred in South Africa of a distinct lack of co-operation between infantry and artillery, entailing little or no success, while a few instances occurred in which the bad handling of artillery produced an effect almost disastrous. These cases cannot be specified; they are merely noted to point out the great importance of the close co-operation of the two arms, and the necessity of insisting on the most skilful employment of artillery.

SPEED AND CONSUMPTION OF STEAMSHIPS.

*By Commander J. F. RUTHVEN,
of the Orient Steam Navigation Company's S.S. "Orontes."*

THE amount of fuel required by a modern steam-ship, whether for the purposes of warfare or commerce, is a most important factor in estimating her usefulness and efficiency. In designing a battleship or cruiser, a torpedo-boat or destroyer, as well as in the case of a mail or cargo steamer, the naval architect has, in conjunction with the engineer, to take into account the coal capacity and endurance that will, whilst fitting in with the general design, give the best results, and it behoves those who have to handle the floating mass of mechanism that constitutes a modern war vessel, or greyhound, to understand the effects of varying the speed, so as to get the best value out of the coal on board according to the object in view. In every case it is necessary to ensure its lasting to the next port, and in time of war it would certainly be desirable to have a sufficient reserve to be able to steam at extreme speed towards the end of the voyage, either for the purpose of chasing or avoiding a chaser, which might only be made possible by husbanding resources at an easier speed in the earlier stages of the passage. A modern man-of-war with her bunkers burnt out would lie helpless under the stroke of perhaps a much smaller antagonist that could choose her own time and method of attack, besides being exposed, in common with all other steam vessels in similar circumstances, to such possible dangers as a lee shore, etc.

The capability of greater speed at a critical moment means increase of power in more senses than one. Not only does it mean more horse-power in the cylinders, but perhaps more power in using weapons that is equivalent to greater power in the weapons themselves, or, what is practically the same thing, a diminution of the offensive power of the enemy.

The difference between the coal endurance of two cruisers may often just mean the difference in the measure of their suitability for a particular purpose, where, amongst other conditions, steaming over a long distance is entailed. This difference may conceivably arise in the same vessel under two different commanders, only one of whom looks well ahead and thinks out, in consultation with his engineer, the details of the task set him, bringing all the scientific knowledge available, as well as practical experience, to bear on it, and providing, as far as human foresight can, for every possible contingency that may arise. It was thus that the greatest of all British seamen and leaders, the immortal Nelson, deserved, and invariably attained, success, if he did not actually command it, and as no practical detail was beneath the notice of the heroic model for all British sailors, I hope that no apology is due for endeavouring to give this modern factor which science has pushed to the front, the prominence I believe it deserves with my professional brethren. The amount of care and thought bestowed on it may just mean the difference between success and failure, whether it be in connection with dividends, or fleet or

single ship actions, or getting the best of your enemy on a trial of speed to a far away port.

Whilst the cube of the speed and two-thirds power of the displacement formula, on which some of the following rules are based, is not universally admitted by experts, it is accepted and used by many of the most eminent, including the Admiralty officials, to work out and compare the results of trials, and to compute the so-called Admiralty co-efficient. I have put it to a practical test during many years of almost continuous sea service, and therefore feel a certain amount of confidence in advocating its claims, until one of its opponents can produce something better. My deductions from it I submit with the confidence of experience to young navigators, with diffidence to those who, with perhaps an equal amount of experience and more ability, have evolved as good, or better, rules for themselves.

The speed and consumption of a steam vessel are closely related, and whilst an accurate record of the former has always been one of the special cares of the navigator, the almost universal adoption of steam propulsion has not given him another measure of the velocity of his vessel, but has forced him to consider this in relation to the amount of fuel he has on board, to make sure that it will enable him to reach port.

If the water did not yield to the thrust of the screw propeller, the ship would be forced ahead for each revolution as many feet as correspond to its pitch, and we should have thus an accurate measure of the speed—more accurate than that of any log.

Owing to the resistance of the ship and the water yielding to the propeller, the distance moved by the ship is usually less than that due to the revolutions and pitch, and the difference is the “*apparent slip*,” or, as it is generally called shortly, the “*slip*.” It is commonly expressed as a percentage of the distance run by the propeller. The slip varies in different vessels and even in the same vessel under different circumstances, especially if there has been any alteration in the propeller. Once it has been correctly ascertained for a ship where the propeller (or propellers) are kept constantly immersed, the revolutions of the engines give, in moderate weather, the most accurate and trustworthy record of speed through the water, and it is a simple operation to make out a table of speeds corresponding to revolutions with various percentages of slip. The amount of slip to allow in each case can only be arrived at by experient or experience, and is generally determined during the builder's trials. It rises slightly with increased speed or displacement.

The following rules will assist the navigator in using the Revolutions to obtain the speed:—

To find the Revolutions per mile corresponding to various slips. First find the Revolutions per mile with no slip by dividing the feet in a mile by the pitch of the propeller. Suppose the latter to be 25 feet,

$$\frac{6080}{25} = 243.2 \text{ feet} = \text{Revolutions per mile with no slip.}$$

Now let x = Revolutions per mile with (say) 5 per cent of slip,

$$\text{then } x - \frac{5x}{100} = \frac{95x}{100} = 243.2 \text{ whence } x = 256.$$

Similarly the revolutions per mile can be found for every percentage of slip that the ship is likely to experience. These figures can be used to turn any number of Revolutions into knots.

Example.

Suppose that the engines have made 76,800 revolutions in the 24 hours, and that the slip is estimated to be 5 per cent. Then

$\frac{76800}{256} = 300$ miles, which is the run by dead reckoning, using the engine-room counter as a speed recorder.

Again as $\frac{\text{Revolutions} \times \text{pitch}}{6080} = \text{knots by engines}$, if we divide the

pitch by 6080, we get a constant for turning revolutions into knots by engines. With the pitch 25 feet the constant is .00411184 the log. of which is 3.614036. This log. added to that of any number of revolutions gives the log. of the knots by engines.

To find the Revolutions *per minute* to give any required speed with any estimated percentage of slip:—

Let V_1 = the hourly speed of the ship, V that of the engines both in knots, p = the pitch of the propeller in feet, a the percentage of slip, and x the Revolutions per minute which it is required to find.

$$\text{Then } V = \frac{x \times 60 \times p}{6080} \text{ whence } x = \frac{V \times 6080}{60 \times p}$$

$$\text{but } V = \frac{V_1 \times 100}{(100 - a)} \text{ and } \therefore x = \frac{V_1 \times 6080 \times 100}{60 \times p \times (100 - a)}$$

Let $V_1 = 15$ knots, $p = 25$ feet and $a = 10$.

$$\text{Then Revolutions per minute} = x = \frac{15 \times 6080 \times 100}{60 \times 25 \times 90} = 67.5.$$

Proof.

$$\frac{67.5 \times 60 \times 25}{6080} = 16.67 \text{ knots. } 16.67 - 10 \text{ per cent.} = 15 \text{ knots.}$$

Here, again, we can get a constant for turning Revolutions per minute into knots per hour by engines, by dividing 6080 into $60 \times p$. With p as above this constant is .24671 and the logarithm 1.392191. This log., added to that of any number of Revolutions per minute, gives the log. of the corresponding knots per hour, or, if more convenient, we can multiply .24671 by the Revolutions per minute. Thus 70 Revolutions per minute $\times .24671$ give 17.27 knots per hour, from which, of course, the estimated slip must be deducted to get the speed of the ship.

By the foregoing rules a table like the following may be constructed, which is a complete substitute for a patent log.

S.S. "————"

Pitch 24 Feet.

SPEED PER HOUR CORRESPONDING TO REVOLUTIONS PER MINUTE.

Revs. per Minute	Speed by Engines	Slip Percentage.													
		4	5	6	7	8	9	10	11	12	14	16	18	20	
50	11.84	11.37	11.25	11.13	11.01	10.89	10.78	10.66	10.54	10.42	10.18	9.95	9.71	9.47	
52	12.32	11.82	11.70	11.58	11.45	11.33	11.21	11.08	10.97	10.84	10.59	10.35	10.10	9.85	
54	12.79	12.28	12.15	12.02	11.89	11.77	11.64	11.51	11.38	11.25	11.00	10.74	10.49	10.23	
56	13.26	12.73	12.60	12.47	12.38	12.21	12.07	11.94	11.80	11.77	11.41	11.14	10.88	10.61	
58	13.74	13.19	13.05	12.91	12.76	12.64	12.50	12.36	12.23	12.09	11.81	11.54	11.26	10.99	
83	19.66	18.87	18.68	18.48	18.28	18.09	17.89	17.69	17.50	17.30	16.91	16.51	16.12	15.73	
84	19.89	19.10	18.90	18.70	18.51	18.31	18.11	17.91	17.71	17.51	17.11	16.72	16.31	15.92	
85	20.13	19.33	19.13	18.93	18.72	18.52	18.32	18.12	17.92	17.72	17.31	16.92	16.51	16.11	
Revs. per Mile	253.3	263.9	266.7	269.5	272.4	275.4	278.4	281.5	284.6	287.9	294.6	301.6	308.9	316.7	

Consumption at any particular displacement is usually estimated separately for the main engines, and for auxiliaries, which are independent of them, and unnecessary for their efficiency, such as fresh water condensers, electric light, refrigerator, galleys, etc., because the former depends almost exclusively on the speed of the ship, whereas the latter is a fairly constant quantity under given conditions, which the velocity of the vessel does not affect.

The speed of the ship depends on the horse-power exerted to propel her through the water, and the consumption for the main engines is in direct proportion to the power developed. Modern engines require from 1.5 to 2 lbs. coal per I.H.P. per hour. Now, whilst if we increase the I.H.P. by 20 per cent., the consumption will advance in the same ratio, it is very different with the speed. As we increase the revolutions, the resistance of the ship increases much more rapidly, and the consumption in a still higher ratio. Except at abnormal speeds, the resistance may be assumed to increase as the square, and the I.H.P. and consumption as the cube of the velocity of the screw—or of the ship with normal slip. Thus, if the engines running at 50 revolutions per minute be opened out to 60, the I.H.P. and consumption will increase in the ratio 50³:60³.

As it is very evident that the same ship will require more horse-power to drive her through the water when she is deeply laden than when she is at a moderate draught, we must introduce another ratio when necessary to meet the variable conditions of service.

The I.H.P. not only varies as the cube of the speed, but also as the two-thirds power of the displacement—*i.e.*, the cube root of the square of the weight of the ship.

Example.

Suppose a steamer on a 24-hours trial burnt 93.46 tons for main engines, and made 15.8 knots per hour, her Displacement being 9,872

tons, what would she consume at 16 knots with her displacement increased to 10,005 tons?

As $15.8^3 : 16^3 :: 93.46 : 97.05$ tons for same displacement and 16-knot speed.

As $\sqrt[3]{9872^3} : \sqrt[3]{10005^3} :: 97.05 : 97.92$ Ans.

Of course, the daily consumption for auxiliaries (say 5 tons) would not vary, and must be added to each of the above figures to get the total daily expenditure of fuel.

At very low speeds the consumption may vary as a lower power, and at very high speeds as a higher power than the cube. Modern experiments with torpedo-boats have, however, shown that at abnormal speeds resistance, having attained a maximum, diminishes again in about the same ratio as it had increased, and the same result would obtain in a large steamer, if sufficient engine power and fuel were available.

The rules above given will meet all ordinary cases that are likely to arise in practice.

If the consumption per day vary as the cube of the speed, that over the whole distance will vary as the square of the velocity, the 3rd power being cancelled by the reduction in steaming time. For let D be the distance between any two ports, V and V_1 two different speeds in knots per hour, and let T and T_1 be the corresponding steaming times in hours, c and c_1 the hourly consumptions, and C and C_1 the total consumptions over the whole distance.

Then as $V^3 : V_1^3 :: c : c_1$,

but $C = \frac{c \cdot D}{V}$ and $C_1 = \frac{c_1 D}{V_1}$

$\therefore VC = c \cdot D$ and $V_1 C_1 = c_1 D$

and so $V^3 : V_1^3 :: VC : V_1 C_1$

whence $V^3 : V_1^3 :: C : C_1$.

Q.E.D.

Similarly it may be shown that:—

If $V^3 : V_1^3 :: c : c_1$ then $V^3 : V_1^3 :: C : C_1$

and if $V^3 : V_1^3 :: c : c_1$ then $V : V_1 :: C : C_1$.

Now let us apply this formula to a case where a commander of a steamer finds his coal margin running low. Suppose that, steaming 15 knots, the coal remaining is found to be 545 tons, while still 1,800 miles from port, the ship consuming 100 tons per day for main engines and 3 for auxiliaries. At 15 knots she would be five days covering the distance, and, burning 103 tons per day, would have a margin of only 30 tons, which in most cases would be undesirably small. We will try the effect of reducing the speed to 13 knots:—

As $15^3 : 13^3 :: 500 : 375.5$ tons,

showing a reduction for the main engines of 124.5 tons.

The consumption for auxiliaries has, however, been increased by lengthening the steaming time—i.e., inversely—as the reduction in speed or:—

As $13 : 15 :: 15 : 17.3$ tons to be added to the engine consumption giving a total of 393 tons, and leaving a margin of 152 tons, which will

probably be sufficient. If not, the speed can be still further reduced. At 10 knots per hour the margin would be 300 tons.

The same result can, of course, be arrived at by using the cube of the speed as the ratio of the consumption *per day* for main engines. At 15 knots the steaming time is 5 days, and at 13 knots 5.77 days. At 15 knots the ship burns $5 \times (100+3) = 515$ tons.

As $15^3 : 13^3 :: 100 : 65.1$ tons. Adding 3 tons per day for auxiliaries, we get $68.1 \times 5.77 = 393$ tons as before for the total consumption.

In some long voyages it may be desirable to vary the speed, keeping the steaming time, and average the same at the finish, when the following formula may be useful to compare the consumption at the uniform with that at the variable speed:—

If V , V_1 and V_2 be three different speeds, such that if $a = V$

$$(a + b) \text{ will } = V_1 \text{ and } (a - b) \text{ will } = V_2$$

$$\text{Then } a.T = (a + b) \frac{T}{2} + (a - b) \frac{T}{2}.$$

Now the consumption at the uniform speed will be to that when the velocity is increased and diminished alternately

$$\text{As } a^3 T : (a + b)^3 \times \frac{T}{2} + (a - b)^3 \frac{T}{2}$$

$$\text{Dividing both terms by } \frac{T}{2}.$$

$$\text{As } 2a^3 : (a + b)^3 + (a - b)^3 :: 2a^3 : 2a^3 + 6ab^2$$

$$\text{or if } a = 15 \text{ and } b = 1$$

$$\text{Then as } 6750 : 6840 :: 100 : 101.3.$$

The theoretical increase of 1.3 per cent. of fuel for the variable speed might easily be compensated for in practice by more favourable conditions for steaming in the early (or later) stages of the voyage. If b is reduced to .5, keeping $a = 15$ as before, it will be found that the increase is but .3 per cent., a quantity obviously too small to merit consideration, if there is any reason at all for varying the speed, such as, for instance, heavy draught or bad weather at the commencement of the voyage.

Example.

Speed.	Distance.	Steaming Time.	Consumption in cwt.s.	
Knots.	Knots.	Hours.	Hourly.	Total.
$V = 15$	$D = 15000$	$T = 1000$	$c = 100$	$C = 100000$
$V_1 = 16$	$d_1 = 8000$	$t_1 = 500$	$c_1 = 121.36$	$C_1 = 60681$
$V_2 = 14$	$d_2 = 7000$	$t_2 = 500$	$c_2 = 81.304$	$C_2 = 40652$

If C_1 and C_2 are added together, they will be found exactly 1.3 per cent. greater than C .

Whilst the cube of the speed rule is an empirical one, it works well in practice within moderate limits. It should be used cautiously

in extreme cases, for which reasons $(a+b)$ should be within the maximum speed of the ship, and the smaller fraction b is of a the better.

Where sufficient data are available, a more accurate method, especially for very high or low speeds, is to construct a diagram from observed I.H.P.'s at various speeds, over measured distances, according to the following rule:—

Divide a horizontal base line into knots to any convenient scale that suits the required range of speed, and the perpendicular at each end of it in like manner to represent the different horse-powers. Connecting similar I.H.P.'s horizontally, and erecting perpendiculars from the points on the base line, will divide the diagram like a chess-board. The ascertained speed corresponding to each I.H.P. developed on trial can then be projected, and the points joined by a flowing curve, as in a Napier's Deviation Diagram, when the I.H.P.'s for intermediate speeds can be measured as required. If the diagram be now tested it will probably be found that at ordinary speeds the I.H.P. varies as the third power of the velocity, whilst at forcing speeds it may reach or exceed the fourth power, and at low speeds may fall to the square. Whatever this ratio may be, one power goes out against the increased (or reduced) steaming time, so that if we get down to a speed where the I.H.P. and consumption for the main engines vary as the square of the velocity, there is no gain whatever, but a loss, inasmuch as the auxiliary consumption rises without any compensation in that required to drive the propeller. This shows that in reducing the speed there is a point in every steamship at which economy ceases. It is reached sooner in vessels with a large auxiliary consumption, which always tends to favour the higher speed (*i.e.*, auxiliary consumption required at sea and not in port).

Reduction of speed for economical reasons is modified in another way by modern high-pressure engines, which do not get the full benefit of expansion at very low speeds. The measurements on the diagram ought to include this effect, if a sufficient number of reliable observations are available for its construction.

With a paucity of observations at the higher or lower speeds, I would rather trust the formula than the diagram, especially for moderate variations from the usual working speed of the vessel, for which the I.H.P. and consumption ought soon to be accurately known.

NAVAL NOTES.

HOMER.—The following are the principal appointments which have been made: Rear-Admirals—H. T. Grenfell, C.M.G., to be Rear-Admiral in the Mediterranean Fleet; Sir R. Poore, Bart., to be a Rear-Admiral in the Mediterranean Fleet; E. S. Poë, C.V.O., to Command of Cruiser Squadron; the Hon. H. Lambton, C.V.O., C.B., to be Rear-Admiral in Command of Cruiser Division of Mediterranean Fleet. Captains—J. A. Tuke to "Undaunted"; J. Denison, to be Superintendent of Pembroke Dockyard; W. S. Rees, C.B., to "Wallaroo"; and in charge of Naval Reserves at Sydney; B. Currey to "Good Hope"; D. Beatty, D.S.O., to "Diana"; T. B. S. Adair to "Montagu"; W. H. Baker-Baker to "Terpsichore"; H. A. Warren to "Empress of India"; E. C. T. Troubridge, C.M.G., M.V.O., to "Victorious"; R. B. Farquhar to "Essex"; J. B. Custance to "Fox." Commanders—M. Woolcombe to "Prometheus"; G. C. Frazer to "Egmont"; G. H. Borrett to "Pioneer." Inspector-General of Hospitals and Fleets—H. M. Ellis to be Director-General of the Medical Department of the Navy, vice Sir H. F. Norbury, K.C.B.

Rear-Admiral E. S. Poë, C.V.O., who succeeds Rear-Admiral Sir W. H. Fawkes, K.C.V.O., in command of the Cruiser Squadron, will hoist his flag on the 8th prox. on board the "Good Hope," at Portsmouth. Rear-Admiral H. T. Grenfell, C.M.G., will succeed Rear-Admiral R. N. Cua-tance, C.V.O., C.M.G., as senior Rear-Admiral in the Mediterranean Fleet; it is believed that in the near future his official appointment will be that of Second-in-Command of the Fleet. Rear-Admiral Sir R. Poore, Bart., succeeds Rear-Admiral W. Des Vœux Hamilton as Junior Rear-Admiral in the Mediterranean Fleet, an appointment which is held at present for one year only; and Rear-Admiral the Hon. H. Lambton, C.V.O., C.B., succeeds Rear-Admiral Sir B. W. Walker, Bart., C.V.O., C.M.G., in the important appointment of Commander of the Cruiser Division of the Fleet.

The first-class battle-ship "Implacable" left Plymouth on the 13th ult. for the Mediterranean. The first-class battle-ship "Formidable" arrived at Portsmouth on the 22nd ult. from the Mediterranean; she paid off on the 30th ult., and recommissioned on the following day for a further term of service in the Mediterranean, leaving on the 5th inst. for her station. The recommissioning of these two ships for a further term of service in the Mediterranean will prove conclusively what is the "life" of the Belleville boilers without a dockyard refit. The boilers of both ships are reported to be in excellent condition, so there would seem to be no reason why they should not complete a full term of six years, one of the charges made against the Bellevilles by their opponents being that they could not stand more than three years' wear and tear.

The second-class cruiser "Hermione," recently returned from the Mediterranean, paid off on the 23rd ult. at Chatham. The second-class cruiser "Retribution" from the North America and West Indies station,

paid off on the 29th ult. at Devonport. The second-class cruiser "Diana" commissioned at Devonport on the 30th ult. for service on the Mediterranean station, where she will relieve the second-class cruiser "Arrogant." The third-class cruiser "Proserpine" left Sheerness on the 5th ult. for the East Indies, where she takes the place of a sister-ship, the "Pomone." The third-class cruiser "Pegasus," from the Mediterranean, paid off on the 22nd ult. at Chatham. The third-class cruiser "Prometheus" commissioned on the 29th ult. at Devonport for service on the North America and West Indies station, where she will relieve the second-class cruiser "Talbot."

Launch.—The new scout "Adventure" was launched on the 8th ult. from the Elswick yard, Newcastle-on-Tyne. Her dimensions are as follows:—Length, 374 feet; beam, 13 feet 3 inches; displacement, 2,850 tons, with a draught of 13 feet 8 inches. Her armament will consist of ten 12-pounder and eight 3-pounder Q.F. guns, with torpedo-tubes. Her engines, which are to develop 16,000-I.H.P., are to give a speed of 25 knots.

FRANCE.—The following are the principal promotions and appointments which have been made: Rear-Admiral—H. E. Boué de Lapeyrère to Command of the Atlantic Naval Division. Capitaines de Vaisseau—E. J. Boisse and E. L. Ternet to be Rear-Admirals; G. L. Prat to "Chateaurenault"; C. E. Favereau to "St. Louis"; L. J. Pivot to "Gloire"; B. S. Sourrieu to "Duplex"; H. E. Campion to "Charles Martel"; O. A. Le Clerc to "Carnot." Capitaines de Frégate—J. M. Farques and J. P. M. Rochas to Capitaines de Vaisseau; A. E. Dupriez to "Styx"; M. P. Jaurès to command of Submarines station at Cherbourg.—*Journal Officiel de la République Française.*

Personal.—Rear-Admiral Boué de Lapeyrère, who has been selected to succeed Rear-Admiral Rivet as Commander-in-Chief of the Atlantic Division, is not only the youngest officer of his rank, but is one of the very few who have attained rank as a captain and flag-officer while still fairly young, as he is only now fifty-two years of age. Rear-Admirals Boisse and Ternet, who have just been promoted to that rank, are fifty-six and fifty-eight respectively, while the two officers promoted to be captains in their place are fifty-three and fifty-two respectively.

Rear-Admiral Bugard, Commanding the Cruiser Division of the Squadron of the North, has shifted his flag from the armoured cruiser "Jeanne d'Arc" to the new armoured cruiser "Gloire," and as a consequence of this change the division under his orders is now a completely homogeneous one, consisting as it does of the "Gloire," "Condé," and "Amiral-Aube," all three being sister-ships.

The new first-class armoured cruiser "Condé" has been commissioned at Lorient, and joined the Northern Squadron at Quiberon on the 30th August, when she relieved the first-class armoured cruiser "Jeanne d'Arc," which ship then proceeded to Brest, where she has since been paid off and placed in the Reserve.

The second-class cruiser "Descartes," which was commissioned on the 16th August at Toulon to relieve the "Pascal," a sister-ship in China, left Toulon finally for her station on the 11th ult., escorting the destroyers "Sabre" and "Francisque," and eight torpedo-boats for the *Défenses*.

Mobiles of Saigon and Diego-Suarez. The flotilla should have consisted of ten torpedo-boats, but at the last moment Nos. 287 and 290 developed defects and had to be left behind; No. 290 had actually started with the others, but had to stop owing to hot bearings. While being taken in tow by No. 287, a fatal accident occurred to one of her petty officers, so she was brought back to Toulon. As soon as ready both boats will proceed to Djibouti, where they will join Nos. 261 and 262, and all four boats will be convoyed from thence to their destination, Diego-Suarez, by the third-class cruiser "Infernet," the senior officer's ship on the East Indian station.

The torpedo dépôt-ship "Foudre" arrived at Saigon on the 15th June with the two small submarines "Lynx" and "Protée" and the four torpedo-vedette boats for the *Défense-Mobile* of that port, and she arrived back at Toulon on the 19th August. She is to embark two more submarines and four more vedette-boats for Saigon, for which port she will probably leave towards the end of the present month.

Dockyard Notes.—The reconstructed coast-defence battle-ship "Furieux" has completed her steam trials successfully off Cherbourg. With the engines developing 3,000-I.H.P., and making 76 revolutions, a speed of 11·5 knots was obtained, with a consumption of coal of 698 gr. (1·39 lbs.) per I.H.P. per hour, and of 70 kg. (154·28 lbs.) per square metre of grate surface. With the engines developing 3,500-I.H.P., and making 81 revolutions, a speed of 13·07 knots was obtained, with a coal consumption of 852 gr. (1·7 lbs.) per I.H.P. per hour, and of 83 kg. (182·85 lbs.) per square metre of grate surface. At her full-speed trials, with the engines developing 5,145-I.H.P., an air pressure of 18mm. (·7 inch), and making 91 revolutions, the mean speed was 14·3 knots, which is half a knot more than her original speed, the coal consumption being 126 kg. (277·7 lbs.) per square metre of grate surface, and 915 gr. (1·83 lbs.) per I.H.P. per hour. The ship was originally launched in 1883 and made her first trials in 1887; she was at that time fitted with cylindrical boilers, but Belleville boilers have now been substituted, with the result that a great economy in the coal consumption has been effected. At her original trials the coal consumption per I.H.P. per hour, during a four hours' run was 1,172 gr. (2·34 lbs.), which, with her new boilers, during a six hours' run, has come down to 698 gr. (1·39 lbs.); during the twenty-four hours' run in 1887, the coal consumption per I.H.P. per hour was 1,025 gr. (2·05 lbs.), this during her recent trials was reduced to 852 gr. (1·7 lbs.); while during the full-speed run the reduction has been from 1,231 gr. (2·46 lbs.) to 915 gr. (1·83 lbs.). The engines, although her original ones, worked well, but as they naturally do not lend themselves to economical working, the results obtained from the new boilers is all the more satisfactory.

Some further additions are to be made to the fortifications of Prest, which, although formidable, are still considered to have some weak points; some new works are to be erected at the entrance to the Goulet, as it is considered quite possible for hostile destroyers to force their way in and destroy the floating dock and pontoon-ship for the *Défense-Mobile*, which are moored off Laberwrach. Some important works are also being carried out at Ushant, where a small garrison is now maintained in order to guard against any surprise attacks at the first outbreak of a war; the points where troops can be disembarked can fortunately be easily defended.

At Lorient the work of fixing the armour of the new first-class cruiser "Victor Hugo," which was commenced on the 16th July, is now

almost completed; the belt is composed of 116 plates 15 feet long, the thickness varying from 6 to 29 inches.

A disastrous fire occurred in the dockyard at Toulon on the night of the 7th August, which resulted in the destruction of the old Vauban slips and the adjoining buildings. These slips date from the 17th century, and have for some time been devoted entirely for the repair and cleaning of the torpedo-boats, several of which were on the slips at the time. Of these, No. 249 (one of those destined for Saigon), 157, 174, and 246, which were on slip No. 1, were all fortunately saved.

Orders have been received by the authorities of the Toulon Yard to forward to Saigon the necessary material for making repairs to the machinery and boilers of the armoured cruisers "Montcalm" and "Amiral Gueydon" and the second-class cruiser "D'Assas," all at present on the China station.

Three torpedo-boats are now being fitted with turbine engines on different systems for experimental purposes; No. 243 with the Renard turbine, No. 293 with the Parsons, and No. 294 with the Breguet.

New Permanent Submarine Commission.—A decree is published in the *Journal Officiel* creating a permanent submarine commission.

In the report which precedes the decree, the Minister of Marine says :—
"It is important that studies in connection with the submarine question should be centralised, and the interest rightly attached to the development and perfecting of an engine destined to effect a change in the conditions of naval warfare makes it desirable to create a distinct branch exclusively charged with examining the conditions and needs of submarine navigation.

"As far as the working of them is concerned," continues the report, "boats constructed to carry torpedoes under water are quite distinct from those made to act on the surface, and the machinery and appliances necessary for the submarine require a separate study, more especially as regards the motor, diving rudder, and the instruments of vision; this study can only be followed by officers who specially devote themselves to it.

"As regards the employment and management of submarines, it is essential that all information obtained should be collected and considered by a central committee.

"These small vessels have hitherto been attached to three of the naval ports, and the officers in command, by daily practice with them, have gained much useful experience; but the information thus obtained has not been centralised in any way, and it has happened that some difficulty under investigation at one of these ports had been already solved elsewhere.

"It is particularly necessary, in the case of submarines, to establish constant inter-communication between the conception of the engineer and the practical experience of the officer in command. Such collaboration has, by the force of things, already been partly established, and it is to this we owe the great progress we have made, for which we are so much envied."

The Minister, after having specified that the term "submarine" is to include also the submersible class, goes on to say :—"The task of the committee will be to centralise all information relative to submarines, both as regards the plans of such vessels, their machinery, reports of inspection, etc. New plans will be submitted to it, but it will not be charged with the duty of itself proposing new plans. To solve such novel and complex problems as those raised by the submarine, nothing is more necessary than

individual encouragement to men of merit, whether naval architects or scientists, or connected with private industry; and that the members of the committee may be exempt from all party bias, it seems to me advisable that they should confine themselves to examining plans and projects originating outside their body. I have therefore not added to the committee any of the eminent engineers, the designers of our best submarines, who will, it is to be hoped, continue their labours for us, and excel their previous designs, being left to their own initiative. This is no new distinction, as in the case of large vessels, the naval architects of the *Section Technique* who draw the plans do not form part of the *Conseil des Travaux* which examines them."

The report concludes by giving the names of the members of the commission as follows:—Rear-Admiral Phillibert (President), First-Class Engineer-in-Chief Ansoher, Capitaine de Frégate Serres, Lieutenants Voisin and Caré, First-Class Engineers Bourdelle and Chapuis.

Needed Reforms in the Dockyards.—The *Yacht*, in a recent article, draws attention to the bad results obtained in the Government dockyards:—

"We are no longer in the 'wooden age,'" proceeds the writer, "during which France acquired universal renown by the skill of her workmen and the rapidity with which her ships were built. In the 17th and 18th centuries the launch of a three-decker of 110 guns, like the 'Royal Louis,' after being only five months on the stocks, was the admiration of Europe; and when the celebrated naval architect Blaise Ollivier was sent on a secret mission to England and Holland to report on the methods employed in the yards of those countries, he was able to state on his return that, as far as naval construction was concerned, France was in every way superior to her rivals.

"We could make no such claim in these days without making ourselves ridiculous. It is only too true that our dockyards construct not only more slowly, but also more dearly than most foreign yards. According to official documents, the mean cost per ton of a battle-ship is:—In England, 1,700 francs (£68); 2,000 francs (£80) in Italy; and 2,300 francs (£92) in France. There is more: The net cost of ships constructed in our dockyards is higher than the selling price for ships built for the State in private yards. The 'Carnot' and the 'Bouvet,' two battle-ships built in the dockyards, cost 28,000,000 francs (£1,120,000) and 28,700,000 francs (£1,148,000) respectively, while the 'Masséna,' a nearly similar ship, built in a private yard, only cost 26,500,000 francs (£1,060,000). Moreover, the displacement of the 'Masséna' was 12,300 tons, that of the 'Carnot' and 'Bouvet' only 12,000. When one considers that the ship-building firms which build for the Government have to pay not only their general expenses, but also dividends to their shareholders, one is amazed at the economic inferiority of the State dockyards.

"For a long time past very severe and well-justified criticisms on this matter have been uttered both in the Chamber and the Senate, and yet the evil still grows. We wish to show to-day how the hopes of reformers will be frustrated as long as we do not retrace our steps from the fatal declivity down which the Navy for some years has been gliding. What is the good of advocating salutary reforms, not to mention the fitting the dockyards with modern plant, such as is used in private yards, when the line of conduct followed by Ministers and Parliament takes them absolutely and more and more from the right path?

"When we come to the question of naval constructions, there are two factors to consider: the value and utilisation of the *matériel*; the value and utilisation of the *personnel*. The first of these factors has a real importance. If the plant in our dockyards was more modern, if the machinery and apparatus in use were better and less obsolete, we could, perhaps, find a certain amount of compensation for the great disadvantage under which our dockyards lie of not having close at hand materials of the first importance, such as coal, iron, etc., with which Nature has so generously endowed certain maritime nations. But the Decree of the 25th August, 1900, in granting autonomy to the different departments has made our engineers administrators, to the detriment of their technical work; they find it increasingly difficult to devote the time to seeing the necessary improvements made in the plant under their charge. It appears, moreover, that these improvements would have but little effect on the output of the dockyards, unless at the same time a radical re-organisation of the *personnel* takes place. There is the kernel of the problem; there one must find the corner-stone on which to reconstruct the edifice, because as the value of the men, so will be the value of the establishment.

"During the last half-century, the Governments which have succeeded one another seem to have made it their object to organise the workmen in the dockyards with the view of getting as little work out of them as possible. Before 1864 they were, for the most part, *Inscrits Maritimes*, and consequently under naval law; they were entitled to a pension on retirement, and their salaries were, for those days, relatively high. Under these conditions the fear of punishment, which is for most among them the beginning of wisdom, together with the suitable remuneration which they received, served as a double stimulus for taking a certain amount of trouble over their work. The law of the 4th June, 1864, abolished service in the *Inscription Maritime* as a qualification, while still maintaining all the advantages pertaining to it. Since 1867 the workmen have no longer been amenable to naval discipline, the *Préfets Maritimes*, however, being permitted to award a maximum of sixty days' imprisonment for certain offences. On the other hand, the salaries have remained lower than those of workmen similarly employed abroad and in the private yards. We had thus a semi-official *personnel*, insufficiently paid, working, with a bad grace, nine and a-half hours a day, and only occasionally induced to depart from their usual lethargy by sometimes receiving higher pay for piece-work, or premiums when unusual capacity was displayed. To this organisation are due the results to which we have drawn attention in the matter of the 'Bouvet' and 'Carnot.'

"We have been furnished by an official of the Ministry of Marine with a still more typical example:—Two cruisers of the same tonnage were laid down about the same date, the one in England, at the Fairfield Works, the other in one of our dockyards. The first-named, the 'Hermes,' cost 6,958,725 francs (£278,349); the second, the 'Jurien de la Gravière,' has cost (exclusive of armament) 10,005,028 francs (£400,201), 3,046,303 francs, or 44 per cent., in excess of the English ship. The English ship was completed in two and a-half years, the 'Jurien de la Gravière' took over five years to complete. In the Estimates for the 'Jurien de la Gravière' the salaries for the workmen amount, in round numbers, to four million francs, which represent, for a mean salary of 3 francs 35 centimes, 1,194,000 days of work. If the English constructors had taken the same number of working days to build the 'Hermes,' they would have expended 7,164,000 francs (£286,560) in salaries alone, or more than the cost of the

ship.' Do not these figures show clearly the slackness of the workmen in our dockyards? One cannot hope for better things from a *personnel* over whom their chiefs can exercise no effective control, and whose poor pay is a direct incitement to idleness.

"It is not without a smile that we recall the words of M. Doumer:— 'We must have a *personnel* of good workmen, hard workers, well paid, and animated by a spirit of discipline.' It would seem that MM. de Lanessan and Pelletan are directly opposed to this formula.

"In 1900 a new era, as a matter of fact, commenced. A decree of the 21st June, affirming the purely civil character, now recognised by the law, of the *personnel* of the dockyards deprives the heads of the Service of the power of punishing the workmen by imprisonment. They are thus now completely de-militarised. As a next step, M. Pelletan, by a circular of the 25th October, 1902, recognised formally the legal existence of the men's unions, and ordered the naval authorities to enter into relations with these bodies. Only, while becoming pure civilians, while obtaining without restrictions the right of striking, the dockyardsmen retain the advantages they held under the former statutes: freedom from being called out for training, pensions according to naval custom, permanence of their appointments, even when there is no work to do, automatic promotion into a special corps, conferring upon them the status of an officer! But the rates of pay remain ridiculous, so that the *mot d'ordre* in the dockyards remains invariably the same. 'The revenge of the badly-paid workman is not to work at all.'

"This is not all. Under pressure from the unions, M. Pelletan has reduced to eight hours the length of the day's work, and has abolished piece-work. The incompatibility of these two reforms is obvious. Without being prophetic, one can predict that the net estimated cost for each of our new 15,000-ton battle-ships will be exceeded in the reality by several millions. How can it be otherwise, when the workman has no personal interest in production, and when the heads of the Service (the engineers and surveyors) have had all authority taken from them?

"Let us admit it: Electoral interests, as soon as they intermeddle in an industrial organisation fatally engender an anti-economic conception of the rights and duties of the State workman. The management of the dockyards, which is growing more and more deplorable, furnishes indisputable proof of it. The present mixed system threatens us with ruin, and one or other of the following radical solutions must be substituted: Either complete militarisation, which will put a check on the turbulence of the unions, by suppressing them; or the normal organisation of civilian workmen in private yards, with all its now well-known consequences. Both cases entail the adoption, in a large measure, of the system of payment by piece-work, which allows of the payment of good men on a commensurate scale. Let us have no more premiums on idleness and to the political orators."—*Le Yacht, Le Temps, and Le Petit Var.*

ITALY.—The following are the principal appointments which have been made: Vice-Admirals—Mirabello to be Minister of Marine; Frigerio to be President of the Superior Council of the Navy; Brochetti to be Vice-President of the Superior Council of the Navy; Palumbo to be Commander-in-Chief of 3rd Department (Venice). Rear-Admirals—Renaudy to be Second-in-Command of Mediterranean Squadron; Grenet to command of Trans-Oceanic Squadron; Bettolo to command of Reserve Division; Coltelletti to command of Maddalena; Palumbo to be Chief of the Naval Station at Tarentum.—*Gazetta Ufficiale.*

The Naval Estimates for 1904-05.—The Estimates, Ordinary and Extraordinary, for 1904-05 amount to 127,191,083 16 lire (£5,087,643 6s.) as compared to 127,181,734 lire (£5,087,269 6s.) voted for last year, showing a decrease of 9,348 94 lire (£374). The principal differences between the two Budgets lies in that whereas in the Ordinary Budget for this year there is an increase of 67,010 lire (£2,680 8s.) in the General Expenses, and of 339,833 90 lire (£13,593 7s.) in the Expenses for the Fleet, there is, on the other hand, in the Extraordinary Estimates a decrease of 30,210 lire (£1,208 15s.) and 376,633 9 lire (£15,065 7s.) respectively, which sums balance each other.

The following are the principal items :—

ORDINARY ESTIMATES—GENERAL EXPENSES.

	Proposed, 1904-5.			Voted, 1903-4.		
	Lire.	£	s.	£	s.	
Ministry of Marine	1,534,512 50 =	(61,380 10)		58,700	2	
Pensions, etc.	5,830,000 00	(233,200 0)		233,200	0	
Expenditure for the Mercantile Marine	9,580,322 00	(383,212 18)		383,212	18	
Total	16,944,834 50	(677,793 8)		675,113	0	

EXPENDITURE FOR NAVAL SERVICES.

Ships Fitting-out, in Reserve, etc. ...	6,070,000 =	(242,800 0)		242,800	0	
Officers' Corps in the Navy	3,660,000	(146,400 0)		146,400	0	
Naval Engineers, etc.	1,351,000	(54,040 0)		54,040	0	
Paymasters and Victualling Department	829,000	(33,160 0)		32,760	0	
Medical Staff	690,000	(27,600 0)		27,600	0	
Men's Pay	12,900,000	(516,000 0)		504,000	0	
Gratuities, etc.	2,394,000	(95,760 0)		84,240	0	
Assistant Officials	120,000	(4,800 0)		4,800	0	
Technical Civil <i>Personnel</i>	1,415,920	(56,636 12)		55,961	19	
Minor Dockyard Officials and Staff	1,489,310	(59,572 8)		59,280	0	
Police	282,000	(11,280 0)		11,320	0	
Semaphore and Carrier Pigeon Service	543,000	(21,720 0)		214,000	0	
<i>Personnel</i> of Coast Local Defence	360,000	(14,400 0)		14,000	0	
Victualling	8,600,000	(344,000 0)		336,000	0	
Barracks, Lighting, etc.	207,000	(8,280 0)		8,280	0	
Hospital Services	548,000	(21,520 0)		21,520	0	
Honorary Distinctions	15,000	(600 0)		600	0	
Coal and other Heating Material ...	6,000,000	(240,000 0)		240,000	0	
Ships' Commodities	1,700,000	(68,000 0)		68,000	0	
<i>Personnel</i> for Building and Fortification Works	110,500	(4,420 0)		4,293	4	
Naval Institute	322,100	(12,884 0)		13,296	0	
Recreation Squares for Naval Academy and Engineering School	54,016	(2,160 13)		2,717	6	
Hydrographical Service	296,662	(11,866 10)		11,698	10	
Law Charges	32,000	(1,280 0)		1,280	0	
Travelling Expenses, etc.	600,000	(24,000 0)		24,000	0	
Transport of Material	125,000	(5,000 0)		5,000	0	
Material for Maintenance of Fleet	5,538,000	(221,520 0)		223,200	0	
Labour for Maintenance of Fleet ...	4,800,000	(152,000 0)		208,640	0	
Material for Maintenance of Guns and Armament	3,826,000	(153,040 0)		154,000	0	
Guns and Armament	2,200,000	(88,000 0)		88,000	0	
Labour for Maintenance of Guns, etc. ...	3,023,025	(120,921 0)		120,921	0	
Material and Labour for Buildings	2,500,000	(100,000 0)		100,000	0	
New Construction	21,200,000	(848,000 0)		896,000	0	
Fuel, Stores, Dockyard Plant, etc. ...	5,200,000	(208,000 0)		200,000	0	
Total	99,001,533	(3,960,061 3)		3,916,467	19	

EXTRAORDINARY ESTIMATES.—GENERAL EXPENSES.

	Proposed, 1904-5.			Voted, 1903-4.	
	Lire.	£	s.	£	s.
Half-Pay, etc.	26,000	=	(1,040 0)	1,040	0
Pay for Officers and Officials for Special Duties	20,830		(833 4)	2,041	12
Total	46,830		(1,873 4)	3,081	12

EXPENDITURE FOR NAVAL SERVICES.

New Construction	4,606,802	=	(184,272 2)	199,337	8
Coast Defence	200,000		(8,000 0)	8,000	0
Torpedo Equipment	200,000		(8,000 0)	8,000	0
Total	5,006,802		(200,272 2)	215,337	8

SUMMARY.

Ordinary Expenditure.

General Expenses, etc.	16,944,834	=	(677,793 8)	675,113	0
Expenditure for Naval Services	99,031,533		3,969,061 3)	3,946,467	19

Extraordinary Expenditure.

General Expenses, etc.	46,830		(1,873 4)	3,081	12
Expenditure for Naval Services	5,068,802		(200,272 2)	215,337	8
Depreciation of Ships in Commission	3,500,000		(140,000 0)	140,000	0
Rent of Crown Lands, used for Naval Purposes	2,631,084		(107,643 9)	107,263	7
Grand Total	127,191,083		(5,087,643 6)	5,087,269	6

NEW CONSTRUCTION.

A sum of 25,806,802.05 lire (£1,032,272 2s.) is demanded for new construction, as compared with £896,000 voted for last year, being a decrease of 1,200,000 lire (£48,000). This sum is apportioned as follows:—

	Lire.	£	s.
A first-class battle-ship of the "Vittorio Emanuele" type to be laid down at Castellamare	500,000	=	(20,000 0)
For the Construction and completion of the following first-class battle-ships—			
"Vittorio Emanuele" at Castellamare and Naples...	6,000,000		(240,000 0)
"Regina Elena" at Spezia	6,000,000		(240,000 0)
"Roma" at Spezia	3,500,000		(140,000 0)
"Napoli" at Castellamare and Naples	3,500,000		(140,000 0)
The first-class armoured cruiser "Francesco Ferruccio" at Venice	500,000		(20,000 0)
The Torpedo-boat destroyers "Zeffiro" and "Espero" at Naples	400,000		(16,000 0)
Two Lagoon gun-boats at private yards	20,000		(800 0)
The submarines, "Glaucos" at Venice and "A," "B"	600,000		(24,000 0)
"C" and "D"	800,000		(32,000 0)
The Transport-avisos "Bronte" and "Sterope" at Leghorn	1,000,000		(40,000 0)
Fourteen first-class torpedo-boats	2,400,000		(96,000 0)
Two Cistern vessels at Venice	50,000		(2,000 0)
Some Harbour Service Vessels	336,802		(13,472 2)

For reconstruction of first-class battle-ship "Italia," a vote of 700,000 lire (£28,000), out of a total vote of 3,000,000 lire (£120,000). For repair of repair depot-ship "Volcano," a vote of 280,000 lire (£11,200), out of a total vote of 680,000 lire (£27,200).—*Stato di Previsione della Spesa d. Ministero della Marina.*

Relative Rank of Naval and Military Officers.—A Royal Decree has recently been issued regulating the relative ranks of officers of the Navy and Army. For the future, Admirals, Vice-Admirals, and Rear-Admirals are to rank with Generals, Lieut.-Generals, and Major-Generals respectively; Captains with Colonels; Frigate-Captains with Lieut.-Colonels; Corvette-Captains with Majors; Lieutenants with Captains; Sub-Lieutenants with Lieutenants; Midshipmen with Sub-Lieutenants. The heads of the other branches of the Navy rank with Major-Generals, and the other ranks with the corresponding ranks in the Army.

The New Organisation of the Torpedo Flotillas.—By a Royal Decree, a "Superior Command of Torpedo-boats" has been substituted for the old "Inspection." All the first and second-class torpedo-boats will come under the new "Command," with the exception of those stationed in the naval ports, which are under the orders of the Departmental Chiefs, the District Commanders, and the Commandant of the Maritime Defence. The boats will be stationed as follows:—

At Civita-Vecchia, under the "Superior Command," will be the seven sea-going torpedo-boats "Aquila," "Avvoltoio," "Condore," "Nibbio," "Falco," "Pellicano," and "Sparviero," with twenty-four second-class boats, of which two will be stationed at Elba, three at Gaëta, and two at Leghorn for the instruction of boys at the Naval School during the time of the normal course.

At Genoa, under the command of the Naval Department, will be seven first-class boats, of which four will be detached to Santa Margherita and Portofino.

At Messina, under the orders of the Local Maritime Defence, eighteen first-class boats.

At Tarento, under the orders of the Reserve Division of the Fleet, twelve.

At Ancona, under the orders of the Reserve Division of the Fleet, four.

At Maddalena, under the District Commander, eighteen.

At Venice, under the orders of the Commandant of the 3rd Marine Department, eight.

All other boats, stationed elsewhere than as above, are to be transferred henceforth to the Headquarters of the New Command.

Steam Trial.—The new first-class battle-ship "Regina Margherita" has completed her trials successfully. Under natural draught, with the engines developing something over 14,000-I.H.P., the ship maintained a speed of 19.3 knots, or more than a knot over the contract, for six hours; under forced draught, with the engines developing 20,600-I.H.P., the speed was 20.2 knots during a run of an hour and a half. The ship was laid down in November, 1898, and launched in May, 1901, having been built in the Royal Dockyard at Spezia, while the engines and boilers were constructed by the firm of Ansaldo, at Genoa. The delay in her completion has been due to the small amounts voted for new construction during recent years, other ships being delayed from a similar cause. She is a sister-ship to the "Benedetto Brin," which is completing at Naples, after having been built at Castellamare.

Her dimensions are as follows:—Length, 413 feet between perpendiculars, 433 feet over all; beam, 78 feet; displacement, 13,426 tons, with a draught of 27 feet. Protection is afforded by a

water-line belt of 6-inch Terni steel, between the barbettes, tapering to 2 inches at the extremities; from this belt rises a citadel extending between the barbettes to the upper deck, also of 6-inch steel, while there is in addition a 3-inch armoured deck, with a 1·2-inch splinter deck above. The barbettes for the heavy guns are of 8-inch steel, with 8-inch hoods; the turrets for the secondary armament are of 6-inch steel. The transverse bulkheads are 10-inch and 8-inch steel.

The armament consists of four 12-inch guns in pairs in barbettes, one forward and one aft; four 8-inch Q.F. guns singly in turrets, sponsoned out two on each beam at corners of casemate; twelve 6-inch Q.F. guns in central casemate, with ten 12-pounders, eight 3-pounders, and four machine guns; there are also four submerged torpedo-tubes. It was originally intended that the armament should consist of two 12-inch guns in a barbette aft, and ten 8-inch guns in pairs in turrets, forward and on the beam.

Steam is supplied by 28 Niclausse water-tube boilers, working at a pressure of 300 lbs.; they are arranged in six compartments, three on each side of the ship, divided by a longitudinal water-tight bulkhead. Her nominal coal capacity is 1,000 tons, but she can carry 2,000 when required, her radius of action being 5,000 to 10,000 miles at 10 knots nominal speed. She has three funnels and two military masts, without the heavy lower fighting tops.

Report on the Explosion on board the "Marco Polo."—The Ministry of Marine has issued the following account of an explosion which occurred on board the Italian cruiser "Marco Polo" at Chemulpo:—"On the 9th ult., in Chemulpo waters, a 152-mm. (5·98-inch) shell exploded by accident in the magazine of the first-class armoured cruiser "Marco Polo." The magazine was at once flooded in order to avoid certain disaster. A seaman and two firemen who were among the men who hurried into the magazine were asphyxiated by the fumes. Seventeen others, including Lieutenant Riccardi and Engineer Lieutenant Russo, were less seriously affected, and are on the way to recovery. The cause of the explosion has not yet been ascertained, but the result of the inquiry which is being held is expected shortly. Admiral Grenet, commanding the naval division of which the "Marco Polo" is the flagship, reports that in this dangerous accident the officers and crew of the cruiser behaved admirably."

A New Submarine.—The submarine "Delfino," having completed her trials at Spezia on 30th August, left for Naples escorted by the torpedo-boat destroyer "Ciclope." She was to go to Naples in short stages, and when there to take part in the combined naval and military manœuvres. The hull of the "Delfino" is constructed of steel plates 30-mm. (1·18 inches) in thickness, and her form is that of a cigar, her length being 78·74 feet, and her beam 9·5 feet. Her displacement varies, according to the extent of her submersion, from 95 to 107 tons. Her engines are worked solely by electricity furnished by 300 accumulators. She has three propellers; one aft for movement ahead or astern, and the other two above for the work of submersion and bringing her to the surface again. The little turret is glazed so that a look-out may be maintained when the boat is submerged. Her sole armament consists of two torpedo-tubes. Her oxygen supply is sufficient for a crew of twelve persons.—*Italia Militare e Marina, Marine Rundschau, and Moniteur de la Flotte.*

RUSSIA.—Dockyard Notes.—The battle-ship "Imperator Alexander II." is being subjected to a thorough overhauling and refitting. Teak is being substituted for pine in the upper deck as being stronger and less liable to deterioration. The wooden sheathing of the bridge is to be replaced by steel. As in the case of the "Boyarin," which was built in Denmark, this steel is of the slightly magnetic kind, supplied by Krupp, from Essen, at a cost of 2,000 marks a ton, as against the ordinary steel costing only 216 marks. On the gun deck also the wood-work will be replaced by lapidite "No 1," and that of the boiler and engine hatches and the like by steel. The questions of rearmament, electric ventilation, new dynamos, etc., are left for consideration by the Constructional Committee. Certain changes in the position of magazines will be made in accordance with the lessons of the war. The whole is estimated to cost some 1,200,000 roubles (£125,000). The armour is good, and new boilers have already been fitted.

The coast-defence battle-ship "Admiral Grieg" has been subjected to a thorough overhaul, a great part of the side armour having been removed to allow of fresh backing being fitted and strained bolts being replaced. A new upper deck has been fitted, and new backing put under the turrets, while superfluous wood-work has been removed from the ward-room and elsewhere.

In spite of careful working out of details and its skilful construction, the mounting for 75-mm. guns, devised by Colonel Müller, has not proved satisfactory, and recourse has been necessary to the Canet system. It was too complex and difficult to handle, and so not favourably regarded on board ship. Accordingly, ships now projected will not be supplied with this mounting. The inventor is now at Port Arthur. It is possible that improvements in the future may lead to its re-adoption.

Ten torpedo-boats under construction at the Baltic Works and as many at the Neva Building Yard have been taken over by the Navy and christened respectively "Kasatka," "Skat," "Makrel," "Sterliad," "Forel," "Osetr," "Losos," "Bieluga," "Som," and "Shchuka," while torpedo-boat No. 150, completed at the first-named, last year, is now known as the "Delphin."

The eight destroyers of the "Buiny" type are being subjected to considerable alterations and improvements as regards armament and torpedo equipment, the result of experience in the fighting against the Japanese, which will also be adhered to in future construction.

The destroyer "Grozny," under construction at the Neva Yard, with a displacement of 350 tons, differs somewhat also from the "Buiny" type, both as to hull and engines, the outcome of experiments made two years ago with four of the "Vnimatelny" type.

Two more torpedo-boats from the Baltic Yard and one under construction at the Neva Yard were also taken over some time back, to be known as the "Nalim," "Okun," and "Peskar."

All large ships now under construction are to be fitted with the Spencer-Miller (American) apparatus for coaling as improved on by Engineer Lieutenant Metcalfe (of our Navy). It is proposed to offer prizes for rapid coaling and rapidly getting up steam; and also to supply stokers with the "Clément" goggles, as adopted in the French Service.

General.—It has been decided by the Council to form an Odessa battalion of sailors especially for transport purposes in time of war, and the training of *personnel* in such duties in peace. Officers will be selected for it from all branches by the commandant of the Odessa Military District.

Recruits will be chosen from the maritime or lacustrine districts, also from skilled mechanics and those trained in technical schools.

Among the work of the Hydrographic Department for the past year may be mentioned the carrying on of the survey of the Gulf of Onega, which was begun as long ago as 1887. As regards the Frozen Ocean, the sea route to Siberia through the Kara Gates was further explored. The passage of them is possible only when the Yugor Shar, already explored, is closed by ice. There was also carried out a survey, very important commercially, of the embouchure of the river Pechora, opening out a short and safe route to the ocean, and greatly facilitating the export of timber from the basin of that river, which already amounts to some millions of roubles. The Murman Coast, in the same sea, has been further surveyed, and various inaccuracies in the existing maps rectified, and the necessity for further efforts made clear.

A work is announced from the pen of the late Vice-Admiral Makarov entitled, "Problems of Naval Tactics," and is a continuation of "An Analysis of the Elements Constituting the Fighting Strength of a Ship," by the same author. Three lectures on Tactics, delivered in 1896 at the Kronstadt Naval Institute, have been amplified into this work. The gist of it seems to be that so much time and effort are taken up in the routine of keeping the ship in good order merely as a ship, that its *raison d'être* as a fighting unit is apt to be neglected. He quotes General Dragomirov, to the effect that the same is very apt to occur among troops. His motto is: "Be mindful of War!" It is curious that he reflects that a state of war is now so rare that few opportunities are afforded for putting the theories of tacticians in practice!

Training of Cadets.—In order to enable naval cadets during their sea training to become familiar with guns of the latest pattern, the second-class cruiser "Rynda" has had her 6-inch guns of the 1877 model, on General Pestich's mountings, replaced by four quite modern 75-mm. guns, on Colonel Müller's carriages, while her 4-pounders have given place to two 47-mm. single-barrelled ones with quicksilver compressors. The former are from the Perm and the latter from the Obuchoff factories. Hitherto the instruction in the Training Squadron has been carried out with obsolete guns or the handling of 5-barrelled Hotchkiss guns. The first-class cruiser "Admiral Kornilov," which had a more modern armament, was this year removed from the squadron, thus leaving the "Rynda" and the torpedo-boat "Pylki" the only approximately modern vessels available.

It is proposed in official circles to establish in one of the Black Sea ports a second Cadet College for the Navy. The sole one now existing at St. Petersburg has shown itself insufficient to turn out a sufficient supply of officers for the Home and Pacific Squadrons, let alone the Mediterranean. Sevastopol or Nicolaieff are spoken of as the places likely to be decided on for the purpose, though at Odessa hopes are entertained that it might be located there. At the first-named, even in winter, lie ships of all types almost fully equipped for the instruction of the cadets by actual practice. The second has, on the other hand, the recommendation of affording an excellent roadstead for the reception of a Training Squadron, while the conditions of life there are more suitable for cadets. Moreover, when the 30-foot canal is completed, Nicolaieff will be in no respect inferior to Sevastopol as a naval centre, visited by even the largest ships, or in importance generally as a naval station, even if it does not outdistance it.—*Kronstädtski Viéstnik.*

UNITED STATES.—*Launches*.—Want of space has prevented our giving details of the following launches earlier :—The new first-class protected cruiser "Charleston" was successfully launched on the 23rd January, from the yard of the Newport News Shipbuilding and Dry Dock Company, Newport News, Va. She was then taken in tow by tugs to a dock at the yard, where she will be completed.

The "Charleston" is an improvement on the cruiser "Olympia." The principal dimensions, armament, and protection of the vessel are :—Length on load water-line, 424 feet; beam (extreme), 66 feet; trial displacement, 9,700 tons; mean draught at normal displacement, 23 feet 6 inches; engines (twin screw), I.H.P., 21,000; speed, 22 knots; normal coal supply, 550 tons; coal bunker capacity, 1,500 tons.

Armament.—Fourteen 6-inch rapid-fire guns, one each on forecastle and quarter-deck, four in upper deck casemates, and eight on main deck; eighteen 14-pound rapid-fire guns, twelve 3-pound rapid-fire guns, four 1-pound automatic guns, eight 1-pound rapid-fire guns, two 1-pound rapid-fire field guns, and two machine guns, 30 calibre, eight automatic guns, 30 calibre.

Protection.—Partial water-line belt, 200 feet long, 7 feet 6 inches deep, and 4 inches thick; casemate battery from belt to upper deck, 133 feet long, 14 feet 2 inches deep, 4 inches thick; 6-inch gun protection, 4 inches; conning tower and shield, 5 inches; signal tower, 4 inches; splinter bulkheads, 2 inches; protective deck, 2½ inches. She has two military masts with fighting tops. Additional platforms are built on the masts to accommodate two search-lights. Electric ammunition hoists will supply the guns.

Four lofty smokestacks, 76 feet 6 inches high, provide draught for sixteen Niclausse water-tube boilers, with a grate area of 1,400 square feet, and a heating surface of 58,800 feet, located in four water-tight compartments, and, together with the engines, protected by the side armour, sloping deck armour and coal bunkers. Wherever wood has been used in construction it is fire-proof. All the latest and best improvements in construction and equipment have been provided for the accommodation and comfort of the officers and crew. The vessel when completed will have a complement of 39 officers and 525 men, and also quarters for a flag officer.

The first-class battle-ship "Virginia" was launched from the yards of the Newport News Shipbuilding and Dry Dock Company, Newport News, Va., on 5th April.

A general description of the vessel is as follows :—Length on load water-line, 435 feet; beam (extreme), 76 feet 2½ inches; draught on normal displacement of 14,987 tons, 23 feet 9 inches; designed I.H.P., 19,000; speed, 19 knots; complement of officers, 40; complement of seamen, marines, etc., 772.

There will be two sets of vertical inverted triple-expansion, direct-acting engines, designed for 19,000 collective H.P., at 120 revolutions per minute. Each engine will be placed in a separate water-tight compartment, and will have cylinders 35 inches, 57 inches, and two 66 inches in diameter, by 48 inches of piston stroke. The 24 water-tube boilers, of the Babcock and Wilcox type, will be arranged in six water-tight compartments. The total heating surface will be 57,534 feet, with a grate area of 1,280 square feet.

The "Virginia" will be protected by an armour belt of Krupp steel extending 5 feet below and 3 feet above the normal load-line from stem to stern. The belt will be 11 inches thick at the top and 8 inches thick at the bottom, tapering to 4 inches at the extremities. The maximum

thickness will be preserved for a depth of 5 feet from the top. The fore conning tower will be 9-inch, voice tube 6-inch, and the after conning tower 5-inch. The ammunition tubes will be 3-inch, and the protective deck 1·8-inch on the flat and 3-inch on the slopes.

The main battery will consist of four 12-inch breech-loading rifles, mounted in two superposed turrets, on the centre line of the vessel, protected by 10-inch armour; eight 8-inch breech-loading rifles, mounted two in each superposed turret and two in each side turret, protected by 6-inch armour, and twelve 6-inch rapid-fire guns on main deck. There will be a secondary battery of twelve 3-inch and twelve 3-pounder guns, besides four 1-pounder automatic guns, four 1-pounder rapid-fire guns, six Colt automatic guns, two machine guns, and two 3-inch field guns. There also will be two submerged torpedo-tubes, and the vessel will have three smoke stacks, standing fore and aft.

The armoured cruiser "California" was successfully launched from the yards of her builders, the Union Iron Works of San Francisco, Cal., on 28th April. The general dimensions and features of the vessel are:—Load water-line length, 502 feet; beam, 70 feet; mean draught, 24 feet; and displacement about 14,000 tons. She will have twin screws, triple-expansion engines, and the "California," "Maryland," and "South Dakota" will be equipped with Babcock & Wilcox boilers, with grate areas of 1,600 square feet, and heating surfaces of 68,000 square feet.

The designed I.H.P. is 23,000, and the proposed speed with 133 revolutions is 22 knots. The normal coal supply is 900 tons; the maximum, 2,000 tons. The machinery weighs 2,100 tons.

The main battery is composed of four 8-inch, 45 calibre, electrically-controlled rifles, in pairs in turrets, one forward and one aft, protected by 6-inch armour, and of fourteen 6-inch, 50 calibre, rapid-fire guns in casemate protected by 5-inch armour. The auxiliary armament is made up of forty-six rapid-fire machine and automatic pieces. Electric hoists supply the ammunition at a very quick rate, and the normal supply is 83 projectiles for each 8-inch, 132 for each 6-inch, and 166 for each of the eighteen 1-pounder pieces. Two submerged tubes are installed well forward of the beam.

Protection is afforded by a complete water-line belt of Krupp steel, 6 inches thick for 244 feet, 7 feet wide, and tapering to 3·5 inches at the extremities; above belt to upper deck for 235 feet, the armour is 5 inches. The conning tower is 9-inch, with 5-inch connecting tube, while the ammunition tubes are 3-inch. Above the protected deck a belt of water-excluding cellulose is carried. The complement will include 822 officers and men.

Submarine-boat Protector Approved.—The War Department has received the report of the Board of officers, consisting of Major Arthur Murray, Artillery Corps; Captain Charles J. Bailey, Artillery Corps; and Captain Charles F. Parker, Artillery Corps, appointed to witness and report upon the submarine boat "Protector," commonly known as the "Lake" submarine boat. The conclusions and recommendations of the Board are as follows:—

For the defence:—First and second.—The Board believes that this type of submarine boat is a most valuable auxiliary to the fixed mine defence, and, in cases where channels cannot be mined owing to depth, rough water, swift tides, or width of channel, it will give the nearest approach to absolute protection now known to the Board. The boat can lie for an indefinite time adjacent to the point to be defended, in either

cruising, awash or submerged condition, by its anchors or at the bottom, ready for instant use, and practically independent of the state of the water, and in telephonic connection with the shore, or can patrol a mined or unmined channel, invisible to the enemy, and able to discharge its torpedoes at all times. It possesses the power of utilising its engines in every condition except the totally submerged, and can always charge its storage batteries while so doing, necessitating its return to shore only when gasoline must be replenished. In narrow channels the boat or boats would have a fixed position with a telephone cable buoyed, or anchored at the bottom. In wide channels they would patrol or lie in mid-channel or where they could readily reach approaching vessels.

Third.—As a picket or scout boat, outside the mine-field or even at extreme range of gun-fire telephone communication can be sustained and information received and instructions sent for attacking approaching vessels.

Fourth.—The test at Newport demonstrated the ease with which the boat can locate and pick up cables, and, with minor alterations in the present model, junction boxes, etc., can be taken into the diving compartment and repaired at leisure, while absolutely protected from hostile interference. The faculty possessed by the boat, of manœuvring on the bottom and sending out divers, leaves little or nothing to be desired in its facilities for doing this work.

For the attack:—The boat shows great superiority over any existing means of attacking mine-fields known to the Board.

First.—It can run by any mine-field, as at present installed, with but little or no danger from the explosion of any particular mine or from gun-fire, during the few seconds it exposes the sighting hood for observations, and can attack at its pleasure vessels in the harbour.

Second and third.—The Board personally witnessed the ease with which cables can be grappled, raised, and cut, while the boat is manœuvring on the bottom; mine cables can be swept for, found and cut, or a diver can be sent out for that purpose.

The Board recommends consideration of the foregoing by the General Staff. The question of the use of the Whitehead torpedo as part of the fixed mine defences, fired from tubes on shore, is now receiving consideration. Where channels are wide and water swift, this use of the Whitehead will be very limited. With boats of this type, the Whitehead can, it is believed, be carried within certain effective range in all ordinary channels, and this alone will warrant the consideration asked for. The Board recommends, in consequence of its conclusions, that five of these boats be purchased for use in submarine defence.—*U.S. Army and Navy Journal*.

MILITARY NOTES.

PRINCIPAL PROMOTIONS AND APPOINTMENTS, SEPTEMBER, 1904.

Lieut.-Generals—Lieut.-General Sir C. C. Egerton, G.C.B., D.S.O., I.A., to be a Lieut.-General on the Staff in India.

Colonels—Colonel H. C. Sclater, C.B., from h.p., to be Q.M.G. in India, and is granted the temporary rank of Major-General whilst so employed. Lieut.-Colonel and Brevet Colonel F. A. Bowles, from h.p., to be a Colonel on the Staff for Royal Artillery in India, and is granted the substantive rank of Colonel in the Army, with the temporary rank of Brigadier-General whilst so employed. Lieut.-Colonel F. M. Maycock, Staff Paymaster, to be Chief Paymaster, with the substantive rank of Colonel in the Army. Brevet Colonel (local Brigadier-General) G. V. Kemball, C.B., D.S.O., Inspector-General of the West African Frontier Force, is granted the substantive rank of Colonel in the Army.

CHINA.—*Proposed Changes in the Exercise of Duty.*—The Shanghai *Hsien wen pan* publishes a report that changes in the method of carrying out duty have been proposed by the commander of a unit. The following are characteristic portions of the interesting contents of that document :—

"It has repeatedly been brought to notice with regard to desertions, that battalion commanders have privately, without making any report on the matter to their superiors, replaced the absentees by new men, and keep the rolls of the former in very imperfect order. In addition, sufficient precautions are not taken to especially prevent desertion. It is therefore now recommended, in order to put a stop to this state of affairs, that :—

"1. Each man should have an exact registration prepared, for the correctness of which he will vouch, by the impression of his right thumb in China ink.

"2. Each man must be in possession of a copy of his registration.

"3. Pay should in future only be counted out by the paymaster, in the presence of the battalion commander.

"4. Of this pay (4·2 tael or 7 shillings a month) every man will be credited with 1 tael a month. Interest will be paid him on the remainder.

"5. The superior authorities must satisfy themselves by frequent and unexpected inspections that the effective of the troops is in accordance with the rolls.

"6. Men may only leave camp if in possession of a pass from their company commander.

"7. Officers must obtain similar permission from the regimental commander.

"8. The battalion commander, with his officers, must personally attend drills, etc., and may only absent himself if prevented from attending by duty elsewhere, when his staff captain may represent him."

The Chinese papers publish a recently-issued proclamation by the commander of the Hupei Army in Tung-tchou, which is characteristic of the conception of discipline and of the spirit at the present moment animating a portion of the recently reorganised Chinese Army:—

"I am aware that my Hupei soldiers are most excellent, orderly, and well disciplined men. Now, however, that we are no longer in Hupei, but in Tung-tchou, every soldier must pay twice as much attention as usual to the exact carrying out of the following orders:—

"1. A roll of the troops will be called, and they must be drilled daily.

"2. No one may leave camp without permission.

"3. All passes must be shown to the guard.

"4. Infringement of passes will be punished.

"5. Officers will be told off to visit the streets, and will report all irregularities to me.

"6. Anyone annoying the population will be reported to his unit by the civil authorities.

"7. In the event of the guards preventing the entry into camp of the latter, the senior local authority will make a special petition to me on the subject.

"8. I will inquire into the matter, and remorselessly punish the guilty. I will shield no soldier who has been guilty of negligence. Tremble and obey!"

The following are the principal offences in war time, with their punishment:—

I. The following will be punished with death:—

1. Whoever runs away in action.
2. Whoever is guilty of desertion in the field or in the presence of the enemy.
3. Whoever offers violence to women.
4. Whoever plunders.
5. Whoever joins forbidden societies.
6. Whoever joins in a mutiny.
7. Whoever spreads false reports amongst his comrades.
8. Whoever opposes marks of the Imperial Sovereign Power.
9. Whoever sells his weapons and cartridges.

II. The following will be punished with the striking off of the right ear and being placed in the stocks:—

1. Whoever gets drunk and disturbs public peace and order.
2. Whoever steals from a comrade.
3. Whoever wilfully damages his weapons.
4. Whoever insults his superiors.
5. Whoever talks at drill without permission.
6. Whoever molests the people.
7. Whoever creates a disturbance in camp.
8. Whoever gambles.
9. Whoever enters strange dwellings.
10. Whoever sows dissension amongst his comrades.

III. The following will be punished with beating, arrest, and dismissal from the Army:—

1. Whoever smokes opium.
2. Whoever frequents disorderly houses.
3. Whoever leaves his garrison without permission.
4. Whoever remains outside camp after Tattoo without permission.
5. Whoever loses his rifle.
6. Whoever executes

a command wrongly when at drill. 7. Whoever refuses obedience. 8. Whoever, with wilful intent to deceive, gives false information with regard to matters of duty. 9. Whoever extorts money from the population. 10. Whoever deceives his superiors.

IV. The following will be punished with 40 strokes from a stick:—

1. Whoever is slack at drill.
2. Whoever does not take sufficient pains to perfect himself in the use of his weapons.
3. Whoever, when on orderly duty, does not mount the night guards at the proper time.
4. Whoever carries out an order in a slovenly manner.
5. Whoever creates a disturbance in quarters.
6. Whoever leaves camp without permission.
7. Whoever does not keep his weapons in a proper condition.
8. Whoever is slovenly in his dress.
9. Whoever does not keep quiet in his quarters after Tattoo.
10. Whoever does not get up when roused.—*Internationale Revue über die gesamten Armeen und Flotten.*

FRANCE.—*Recruiting Statistics for 1903.*—The number of young men of the 1902 class inscribed on the lists in January, 1903, amounted to 324,253, a decrease of 760 on the number of the class of the preceding year. By adding to that number those put back from 1901 (42,372) and from 1900 (21,422) the total recruiting resources amounted to 388,074 men, who were distributed as follows:—

	Men.
Exempt, as unfit for service, dead, etc. ...	31,875
Not allowed to serve (bad characters, etc.) ...	69
Put back	86,801
Living abroad (out of Europe)	710
Naturalised and exempt on account of age ...	1,235
Enrolled in the Auxiliary Services	31,565
Serving as Volunteers { in the Army (a) ...	27,870
in the Navy ...	5,257
Enrolled for 1, 2, or 3 years (b)	202,665
Total	388,047

2,716 men of the contingent, enrolled for 1, 2, or 3 years were drafted into the colonial troops. The contingent for the Home Army was thus reduced to 199,949 men.

In the course of the year the number of young men who enlisted before reaching the age for military service amounted to 18,407 for the Home Army and 3,938 for the colonial troops. By adding these to the numbers mentioned under the figures *a* and *b*, the total number of 252,880 men is obtained for the 1903 contingent, of whom 246,226 were drafted into the Home Army. So as to be absolutely correct, however, 8,637 men who failed to appear, but who were posted as though present, but who, for the most part, never joined the colours, should be deducted from the total number given above. The 202,665 men called to the colours, and the 22,345 who enlisted before reaching the age for military service were distributed in the following proportions amongst the various branches of the Service:—

Home Army.

	Called out for 1 year.	Called out for 2 and 3 years.	Called out for 3 and 5 years.
Infantry	51,124	88,615	10,843
Cavalry	134	18,837	2,965
Artillery	8,972	19,552	3,922
Engineers	1,010	4,040	677
Transport	1,110	1,955	—
Administration Troops, etc.	1,561	3,039	—
Totals	63,911	136,038	18,407

Colonial Troops.

Infantry	224	1,332	3,037
Artillery	480	680	901
Totals	704	2,012	3,938

The contingent for the Home Army shows a decrease of 38,745 men on that of the 1901 class, which was 238,694 men.

As regards education, the 324,253 recruits, borne on the rolls, are classified as follows:—

Neither read nor write	12,444	or 3.84 per cent.
Able to read only	3,603	„ 1.11 „
Able to read and write	33,534	„ 10.34 „
Having a higher primary education	250,859	„ 77.36 „
Having a certificate of primary education	4,915	„ 1.52 „
With degrees	6,611	„ 2.04 „
State of education unknown	12,287	„ 3.79 „

The calling to the colours of the men of the 1902 class took place on the 14th, 15th, and 16th November, 1903.—*Bulletin de la Presse et de la Bibliographie Militaires.*

GERMANY.—*Change of Artillery and the 4-gun Battery.*—The question with regard to the change of the present German artillery *matériel* into barrel-recoiling *matériel* which has been decided upon in principle, and which is on the point of being carried out, is the cause of frequent discussions in the German Press on the advisability of either retaining the 6-gun battery or of adopting that of 4 guns, as has been already done in France.

Generals Rohne and von Blume have vigorously taken up the cudgels for the 4-gun battery. The former observes that the only means of not inordinately increasing the number of artillery wagons, already so numerous, is to replace 2 guns by 2 ammunition wagons in each battery, which would have the effect of allotting 4 guns and 8 ammunition wagons to each battery, instead of 6 guns and 6 ammunition wagons as at present. The latter remarks that if it is admitted that the battle front of an army corps on the offensive is limited to 3,000 metres, the artillery consisting of 24 batteries of 6 guns would require 2,500 metres, leaving thus hardly any space entirely free for the infantry. On the other hand, with 24 batteries of 4 guns each, the artillery would not require a front of more than 1,500 metres, and the infantry would thus obtain the space necessary for its employment.

An article in the *Neue Militärische Blätter* observes, on the subject of the decrease in the number of guns, that in the Napoleonic wars the

Prussian Army had only 2 or 3 guns to every 1,000 infantry. In 1870 it entered the field with a proportion of 3.3 to 3.6 guns per 1,000 men. At the present time the proportion has risen to 5.76 guns to every 1,000 men. Should the 4-gun battery be adopted, whilst still retaining the same number of batteries, the proportion would again sink to 3.84 guns per 1,000 men. The fact, however, must not be lost sight of that as rapidity of fire demands a larger supply of ammunition, the number of ammunition wagons must necessarily be very great. During the wars at the beginning of the 19th century there was only 1 ammunition wagon to 12 guns; at the present time the German artillery requires 1½ ammunition wagons for every gun. If, then, the 6-gun batteries are retained, the number of the ammunition wagons must be considerably increased, which would be very costly, would require a large number of horses, and would greatly lengthen the columns. "Finally," says the above-mentioned journal, "the adoption of the 4-gun battery would be a great relief both to the taxpayer and to the Budget. It would mean about 1,500 guns less to alter or make for the 23 German army corps, and in addition only the same number of ammunition wagons would have to be made. It is impossible to calculate the saving that would result at first sight. The question of 6 or 4 gun batteries is essentially a purely military one, and should only be regarded from that point of view. But when one sees such competent officers as Generals Rohne and von Blume urging the decrease in the number of guns, one is justified in also considering the economic side of the question."

ITALY.—*The Landing Manœuvres.*—The *Popolo Romano* in a recent number criticises the landing manœuvres which have recently terminated, and endeavours to deduce conclusions from them. The following is a very brief summary of the article in the Italian journal:—

The special object of these manœuvres was to experiment on and to study the methods for embarking an organised army unit (about 5,000 men) with its artillery, cavalry, bridging equipage, telegraphic park, field bakery, and, in short, all the *matériel* necessary for its 1st and 2nd lines. It was, in addition, necessary to disembark this unit as rapidly as possible in order that the troops might take up a position, and that the various departments should be in a state to immediately carry out their duties. The General Staff of the Army have been for several years studying the solution of this problem, and as a consequence the troops and their *matériel* were embarked in 10 merchant ships in the course of a few hours—viz., between 5 a.m. and 2 p.m. These transports were escorted by 6 battle-ships, 9 destroyers, and 6 torpedo-boats.

It should, however, be observed that all vessels of the mercantile marine do not lend themselves readily to the rôle of large military transport, especially with regard to animals and wagons. This is a fact which must in the future be reckoned with in the construction of these vessels. It would be advisable to see if it is not possible from henceforth to provide special apparatus for the embarkation of troops and their *matériel* on vessels of the Italian General Navigation Company, which are supposed to form an Auxiliary Fleet in war time.

A new problem, requiring a very delicate solution, was set the admiral commanding the squadron. He had to conduct his convoy as in war, ward off all attacks of a hostile fleet, and to deceive the defenders as to his point of disembarkation. The time at his disposal was limited, because these 10 merchant vessels had only been hired for four days. Given the

time necessary for embarkation and disembarkation, the admiral had only 48 hours available for manœuvring. Rear-Admiral Renaudy having left Naples on the 1st September arrived at 3 a.m. in the Gulf of Pozzuoli, and after overcoming the resistance of the defenders, commenced the disembarkation of his men. The first position was occupied in a few minutes by some of the crews from the fleet and some light artillery guns. Under the protection of the bluejackets the disembarkation of the Army units commenced. At the end of two hours the greater portion of the troops had landed and taken up a strong position to cover the disembarkation of the *matériel*, which took place at mid-day, and which was hindered by heavy rain.

According to the scheme given, the landing of the attacking force was not seriously opposed by the defence, for the former had at its disposal a strong fleet, mistress of the sea. But whilst the landing was being carried out, General Tardeti, who commanded the defence, had time to mass his force round the Gulf of Pozzuoli and to surround the attacking force. It is highly probable that, as a matter of fact, he might have drawn his investing circle closer, and obliged his opponent to re-embark or else have driven him into the sea. That this was not done was on account of the necessity to have manœuvres. Under these circumstances, the Director of the Manœuvres took a brigade from the defenders, with which he reinforced the attackers, so as to give an appearance of reality to the tactical operations which were about to follow.

The carrying out of the land operations demonstrated that the territorial Militia was neither fitted for coast defence nor for warlike operations consequent on a landing. The men of this Militia require to be taken in hand for several days; further, it is difficult, not to say impossible, to give them that training, which is indispensable, to enable them to support the fatigue incidental to long marches and to operations in close country. For these reasons the 3 territorial regiments were of no use to the defence. In the same way the calling out and the distribution of 8 coast-defence companies along the threatened coast was perfectly useless. As a matter of fact, semaphores sufficed for the discovery of the hostile convoy; custom-house officers and cyclists amply sufficed for the rapid dissemination of information and orders between the telegraph offices and the troops; in addition, for coast-defence steady and very well drilled troops are necessary.

JAPAN.—*The Japanese Army.*—The *Pester Lloyd* of Buda-Pest has recently published a synopsis of the Japanese military organisation, due to Field-Marshal Oyama, Chief of the Japanese General Staff, and at present commanding the Japanese Armies in Manchuria. This synopsis is one of the most comprehensive and condensed documents on the Japanese Army, and supplements the account already published in the *Military Notes of the JOURNAL* for November, 1903.

The Emperor is the supreme head of the Army and the Navy, and has the chief command of the whole of the national forces. The Emperor nominates the War Minister, the Chief of the General Staff, the Director-General of Military Schools, as well as the members of the Military Council, who must be consulted on all military matters. The War Minister regulates all military matters; he exercises the chief command over both officers and men, as well as over the military employés, and he controls the following services:—The War Council; the Military Engineering Council; the Military Medical Council; the Military

Veterinary Council; the Army Remount; Armament; Arsenal; War Dépôt; Fortifications; the Formosa Supplementary Dépôt; the Central Grain Store; Clothing Department; the military factory for Senju cloth; the dépôt for Army medical *matériel*; the Commissariat Military School; the Army schools for surgeons and veterinary surgeons. The Chief of the General Staff prepares plans for the defence of the country, and issues orders for Army changes, and, according to the Emperor's decision, transmits the plans to the War Minister. The Chief of the General Staff exercises command over all officers of the Staff, and he has direct supervision over the Staff College and the Geographic Section. The Inspector-General of Military Education exercises general supervision over the cavalry, foot artillery, fortress artillery, engineers, and commissariat; he is responsible for the uniformity and for the perfecting of all branches of military education. The various inspectors-general are responsible for the military training of their own special branches of the Service. The Director-General of Military Schools supervises the following schools:—The Artillery and Engineer School; the Toyama School (including the School of Military Music); the Military School; the Central Cadet School; the local Cadet Schools; the Cavalry School; the Field Artillery School of Gunnery; the Fortress Artillery School of Gunnery.

The whole of Japan is divided into 3 army corps subdivided into 3 presidencies, each presidency is itself subdivided into 4 divisional circles, each divisional circle consists of 4 to 8 regimental circles, altogether 12 divisional and 52 regimental circles. Some of the divisional circles have, in addition to the regimental, from 1 to 5 military circles, called *Kei-bitoku*. Japan has altogether 7 of these special military circles.

Up to the Chino-Japanese war the Army was organised as follows:—1 Guards division, 6 line divisions, 2 regiments of fortress artillery. After the war the Army was increased and consisted of:—1 Guards division, 6 line divisions, 2 cavalry brigades, 2 field artillery brigades, 5 regiments and 4 battalions of fortress artillery, 1 railway battalion, etc. The Japanese Army of to-day consists of:—Guards, 1 division; line, 12 divisions; cavalry, 2 brigades; field artillery, 2 brigades; fortress artillery, 5 regiments and 4 battalions; 1 railway battalion; 1 battalion of the special Infantry Military Circle; 3 combined brigades as garrison of Formosa; 15 circles of gendarmerie.

A division in peace time comprises 2 infantry brigades, 1 cavalry regiment, 1 field artillery regiment, 1 engineer battalion, and 1 commissariat battalion. The infantry and fortress artillery are armed with the rifle described in the JOURNAL for June, 1904, the cavalry and commissariat are armed with a carbine of the same type. The armament of the Japanese field and mountain artillery has already been described in the same JOURNAL.

In war time the Emperor orders the mobilisation of the whole or a portion of the Army, and prepares plans for the whole of the national forces. These forces habitually make up an army consisting of several infantry divisions, several brigades of cavalry, field artillery, field telegraph, several Landwehr Corps, and the Staff. The war strength of a division is ordinarily as follows:—2 infantry brigades, 1 cavalry regiment, 1 field artillery regiment, 1 engineer battalion, 1 bridging equipage, 1 ammunition battalion, 1 battalion of commissariat *personnel*, and medical *personnel*.

The transport of troops and of horses and of their rations by land or sea is exclusively carried out by the military; it is only in special cases

that other methods are employed. The regimental transport, drawn by horses, is divided into 2 sections—viz.: The Fighting Section, consisting of reserve horses for the men, ammunition, and medical *matériel*; the Camp Section, comprising baggage, rations, etc. In addition there is the divisional supply transport, in which are included the ammunition battalion, the commissariat *personnel*, porters, the field ambulance, and bridging equipage. Supplies for men and horses in war are distributed as follows:—For troops in the fighting line and porters, 7 days; rations carried by the soldier, 2 days; supplementary rations, 1 day; rations carried by divisional transport, 4 days. The men of the divisional transport have rations for 3 days—viz.: rations carried by the soldier, 2 days; reserve rations, 1 day.

Every Japanese subject between the ages of 17 and 40 years is liable to military service in the Army or Navy. This service is sub-divided into four parts: the Regular Army (Active and Reserve), the *landwehr*, troops to complete war establishment, and the *landsturm*. The Regular Army and the supplementary troops are called out every year, to the number necessary, by drawing lots. Soldiers fit for active service are taken from men who have reached their 20th year; those compelled to serve may, if they wish, enter the Army at the age of 17. Recruiting is managed by the headquarter staff of the regimental circle and by the chief of the headquarter staff of the general commanding the division in which that circle is situated. The period of service is 3 years with the colours, 4 years and 4 months in the Reserve, and 3 years in the *landwehr*; the supplementary troops put in 1 year in the first category, 4 months in the second, and 7 years and 4 months in the third; the *landsturm* consists of men of from 17 to 40 years of age.¹ The pay of the soldiers varies according to the class: those belonging to the 1st Class receive 18 yen a year, those in the 2nd Class 14 yen, 40 sen a year, and those in the 3rd Class 10 yen, 80 sen a year. A yen is equivalent to about 1s. 8d. in English money, and 200 sen go to a yen. There are five descriptions of pensions, viz:—

1. On discharge after 11 years' service.
2. On discharge in consequence of wounds received on active service or on duty.
3. In consequence of a dangerous wound received in action or in the execution of duty, a supplementary annual pension of 9 yen 32 sen may be awarded, in addition to the above pensions.
4. For a slight wound on duty entailing dismissal from the Regular Army a bonus of between 14 and 140 yen may be awarded.
5. In the event of a soldier's death in action or on duty, his widow and orphans receive an annual pension of between 15 and 30 yen.

¹ An emergency ordinance amending the Conscription Laws has, however, been recently gazetted. It extends the period for Reservists of the 2nd Class from 5 to 10 years, and abolishes the distinction between conscripts of the 1st and 2nd Classes of the Reserve. Reservists will be discharged at the age of 37. This increase of the Army necessitates a new scheme of divisional organisation, the plan for which has not yet been made public.

Details regarding the military administration and the recruiting and nomination of officers have already been dealt with in the JOURNAL for November, 1903.

NORWAY.—*Rapid-Fire Field Artillery, Ehrhardt System.*—The Norwegian artillery was the first to follow the example of France by adopting a rapid-fire field gun with long recoil on the carriage. The Ehrhardt model was selected. The gun is of 75 mm. calibre, has the Nordenfelt eccentric screw fermeture, and is mounted on a telescopic-trail carriage. This material was definitely adopted on 8th July, 1901, after competitive tests and extended trials of models submitted by various competitors. The Rheinische Metallwaaren und Maschinenfabrik received an order from the Norwegian Government for 132 guns, with 500 rounds per piece, and for 72 caissons. This material was issued to the troops in July, 1902.

As with the French field gun, rapidity of fire (over 20 rounds per minute) is the essential feature of the Norwegian gun. Its principal points are the following:—

1. The carriage remains very steady during firing, not only on level ground, but also when the ground slopes to the rear. The telescopic arrangement for lengthening the trail ensures this stability in cases when a trail of ordinary length would not be sufficient. There are no shoes to lower under the wheels. The road brakes can be applied when firing is executed, but it is not necessary to do so.

2. The gunners, seated or kneeling at their posts, can carry on the service of the gun continuously.

3. The detachment is protected by detachable shields, proof against shrapnel bullets and infantry fire.

4. Derangement of aim during firing is suppressed. The gun does not possess the "independent line of sight."

5. Fixed ammunition is used.

6. The shrapnel weighs 14.3 lbs., and contains 280 11-gram bullets. The fuze is a combination one; the limit of time-fuze fire, 6,100 yards. Explosive shell has not yet been adopted.

7. The muzzle velocity is 1,640 f.s.

8. The Ehrhardt process for producing weldless and non-riveted tubes has been extensively employed in the construction of the gun, the cradle, the trail, the axle, the projectile bodies, the sockets, etc., thus ensuring great strength and lightness.

The gun is of nickel-steel, with a jacket, the joint being covered by a screw collar. It rests on the cradle and is fixed to the brake-cylinder, which it drags to the rear on discharge, and which brings it back into the firing position by means of springs, after it has recoiled a distance of from 39 to 48 inches. Slots engaging the guide rails on the cradle keep the gun in position. Along the gun on each side and in rear are fixed plates protecting the cradle. The breech mechanism is the Nordenfelt eccentric screw, and is so arranged that the layer, seated on the left of the breech, fires the gun. The thick shoulder of the breech block, due to the eccentric screw, is turned towards the top, which gives advantages in placing the gun on the cradle and increases the maximum angle of elevation. The French model is similar.

The carriage consists of a cradle and top-carriage, and a lower carriage with telescopic tubular trail and trail spade.

The cradle is trough-shaped, without weld or rivet, carries the gun and encloses the hydraulic brake and recuperating springs. The brake piston

is fixed to the front end of the cradle, while the brake-cylinder is drawn to the rear by a lug on the breech. The recuperating springs are disposed round the cylinder; they are compressed on recoil against the rear end of the cradle, and bring the gun back into the firing position. The walls of the cradle, like the protecting plates, are sufficiently removed from the parts they cover to keep the bosses on their surfaces from interfering with the movements of recoil and return.

The cradle is supported in the middle by a top-carriage, which is attached to the axle, and forms a pivot; and in rear, by the laying mechanism. The motion of the cradle for laying in elevation is about the axle of the piece, and for lateral direction is about this pivot. The sights are on the cradle, and the foresight can be folded down.

Lower carriage. The trail consists of two steel tubes of circular cross-section, fitting telescopically one inside the other. Thus a comparatively short trail can be used on the march, or when shooting either on a slope trending downwards toward the objective or at long ranges. For small angles of elevation, or on ground sloping to the rear, an extension of 27.56 inches can be obtained.

The lengthening and shortening of the trail is quickly carried out. The former movement is made generally after the first round, which fixes the spade in the ground; it is not, however, indispensable to the steadiness of the gun on level ground. It is not extremely inconvenient to manœuvre, limbered up with the trail elongated.

At the end of the trail is a short fixed "spur," a folding trail-spade, and a traversing handspike, also folding. There are two seats on the carriage, one on the left for the layer, the other on the right for the number working the breech screw.

A travelling road brake, with shoes, can be applied if desired during firing.

The axle is hollow. The nave is of compressed steel. Two seats are provided on the axle for the detachment on the march. The carriage is fitted with detachable shields, which are, as a rule, carried on the caissons or limbers.

The caissons and limbers are very light, owing to the fact that steel tubing is largely employed in their construction. The stores are packed as low as possible. The fixed ammunition lies horizontally, separated by coconut matting, in wicker baskets containing 4 rounds each. The limber carries 36, and each caisson 112. The caisson bodies are not armoured.

Ammunition. Shrapnel and explosive shell; the pattern of the latter has not yet been finally decided on. The former is grooved on the inside, and has the bursting charge in the base, and a smoke-producing composition assists observation. With the fuse set at 0 the shrapnel serves as case shot.

The following are some extracts from a report of practice and marching tests carried out at Lexdalen, 4th-10th August, 1903. These experiments were made with a view to determine the ballistic qualities of the new material, and for the purpose of drawing up as soon as possible the drill regulations and instructions for practice for the new gun:—

The material was entirely satisfactory, except that a better sight was considered advisable.

The Rödfof powder produced a considerable amount of smoke.

The fuses acted admirably at long ranges, but were somewhat erratic at short ones, varying as much as 169 yards in 8 or 9 rounds.

Two baskets containing 4 pounds were put under water, one for 15 and one for 30 minutes, without affecting the subsequent practice.

The shields, which are 1.38 inch thick, were scarcely dented by shrapnel bullets, but fuses and large portions of projectiles easily penetrated them. The quality of the metal is excellent.

The Committee consider that accurate shooting is possible up to 4,900 yards, and that an enemy can be considerably harassed up to 6,000 yards.—*Revue de l'Armée Belge* and *Journal of the United States Artillery*.

SWITZERLAND.—*New Field Service Regulation*.—On the 1st May last a new Field Service Regulation was issued to the Swiss Army to replace that of 1882. The new regulation consists of 14 chapters, viz. :—

1st, Service reports; 2nd, marches; 3rd, cantonnements and bivouacs; 4th, transports; 5th, reconnaissance and security service; 6th, field service in high altitudes; 7th, ammunition supply; 8th, employment of engineers; 9th, subsistence; 10th, medical service in the field; 11th, veterinary service; 12th, lines of communication; 13th, territorial service; 14th, instructions relative to manœuvres.

The first chapter contains nothing very special. There is little to note except the confirmation of the employment by infantry in broken ground, of signalling flags, of which there are two per section, and which "facilitate the transport of simple reports for distances of one or two kilometres as the crow flies." The flags are square, half red and half white, and are fixed on a bayonet.

Marches are divided into route marches and marches under service conditions. It lays down that marches of large bodies of infantry may be from 25 to 30 kilometres a day, cavalry from 30 to 40; 60 to 70 kilometres being regarded as a forced march for cavalry. As a rule troops will assemble in column of route before setting out on the march ordered. Halts are generally made every hour, but this may be dispensed with when in the neighbourhood of the enemy.

There is nothing special in the instructions regarding lengthy halts in stations. The normal bivouac formation of an infantry battalion is in line of company columns, each company itself being in line of sections, and having a front of 40 paces.

The chapter on transports distinguishes the fighting from the regimental transport. Ammunition wagons must follow immediately behind their unit. The fighting transport (*Gefechtstrain*) includes the wagons containing the daily supply of food and corn, wagons for tools, and medical wagons; the regimental transport (*Bagagetrain*) the other wagons containing food supplies and baggage wagons.

The chapter with regard to scouting is most interesting, and is treated in greater detail. The mobilisation is protected by detachments of frontier guards formed partly through field army units and partly through the territorial troops. The cavalry then immediately covers the zone of assembly supported, if necessary, by troops from other branches of the Service. Intelligence is procured by means of cavalry reconnaissance, by espionage, and by the supervision of the inhabitants and of their private correspondence. It rests with commanders of independent cavalry to co-ordinate these various elements. The latter unmasks the front when in contact with the enemy, and is then replaced by the divisional cavalry and by the security detachments of columns, such as advance, flank, and rear guards. No fixed numbers are laid down for the strength of the

latter; but as a rule the advance guard should not exceed a brigade of infantry for an army corps, a regiment for a division, and a battalion for a brigade. An infantry point should precede by 2,000 metres the troops to be covered. A company of the advance guard should be 500 metres in advance of the main column, a battalion 1,000 metres, a regiment 2,000 metres, and a brigade 3,000 metres. Outposts are distinguished, according to their objects, as outposts on the march, station outposts, and fighting outposts, their various organisations being very similar to the German. At the same time, the Swiss regulations do not provide for examining posts as do the German, it being left to the discretion of commanders of small posts to discriminate as to who may enter or leave the line of outposts.

Field service in high altitudes is very sensibly treated. This chapter demonstrates the peculiarity of the march and of outpost duty in mountains.

The chapter on ammunition supply contains nothing of special interest. In addition to the 120 cartridges carried by the soldier there are two ammunition wagons per battalion, containing 17,200 cartridges each, the army corps park having two more wagons per battalion. The dépôt park supplies the army corps parks, and is itself refilled by the arsenals.

The chapter on the employment of engineers is new, but contains no very original instructions.

The chapter on rations lays down for methods of subsistence, viz. : By the money payment, 1 franc per man per day; by requisition on individuals or municipalities; by the delivery in kind of the supplies requisitioned or bought and prepared by the troops themselves; finally, the use of the reserve rations. General officers may supplement the ordinary rations in case of great fatigue. As a rule corps feed themselves, and do not have recourse to the commissariat and administration supply column, except in case of necessity. Each man carries two days' reserve rations; the daily rations are with the fighting transport, another day's rations with the regimental transport, and finally, two more days' rations with the administration supply columns.

There is nothing special to note with regard to the medical and veterinary services.

The service of the lines of communication are treated in great detail. These are under a chief of the transport service, who is himself subordinate to the General Staff, and who has two assistants under him, one for halting places on the march, and the other for railways.

The territorial service, directed by the War Department in war time, is divided among 9 commanders of territorial districts or zones, each responsible for the security of the Army communications through the territorial troops. Each of these commanders is assisted by a landsturm commander, who regulates the employment of the landsturm units and the requisition of horses and wagons. Recruit and remount dépôts and all military establishments are under the supervision of the district commander.

The last chapter, with regard to manœuvres, is principally devoted to regulating the duties of umpires at manœuvres, in order to preserve a certain appearance of reality, and to lay down indispensable manœuvre conditions.—*La France Militaire*.

New Military Organisation.—The draft of the new Swiss Military Organisation is of very great general interest, in that it demonstrates how the Swiss nation endeavours to maintain its Army ready in all respects and at the height of modern requirements for war. Starting from this standpoint, the present draft deals first with liability for service, and lays down as the principal axiom one that insists that every Swiss citizen, according to his ability, should be liable to be drawn for military service.

Radical changes in the organisation of the Army are provided for. Entry into the Army must be made direct from the existing recruit schools. The Army will consist of the Field Army, the Landwehr, and the Landsturm. The Field Army will be composed of all men liable to service between the ages of 20 and 33 inclusive; the Landwehr of those most liable to service between the ages of 34 and 39. To the Landsturm will belong those men not drafted into the Field Army or the Landwehr, between the ages of 20 and 50 inclusive, and also of Volunteers of a less or greater age. In the cavalry the period of service with the Field Army continues up to and including 30 years of age, in the Landwehr up to 39 inclusive. Captains may continue in the Field Army up to the age of 38, and in the Landwehr up to that of 44. Staff officers may serve in the Field Army up to the age of 44, and in the Landwehr up to the age of 50. They can, with their own consent, be retained after the age limits.

Of special importance for the future well-being of the Army is the demand for the new reform scheme for a fresh territorial distribution of the country, for only in that way can a suitable distribution of the Army, for strategic requirements, become possible. Six divisional districts with 6 corresponding divisions will be formed for the infantry, instead of the quadruple formation, each divided into 3 units, that has hitherto obtained. Each division will, according to the scheme, consist of 3 infantry brigades of 3 regiments of 3 battalions of 3 companies of 3 squads each; each battalion will be 697 men strong. In addition a cavalry brigade of 2 regiments of 3 squadrons, an artillery brigade of 2 regiments of 2 brigade divisions of 3 batteries, 1 sapper battalion, 1 park column, a field hospital, and a supply column will be attached to each division. The former army corps distribution, viz., the division of the Army into 4 army corps for peace time, is entirely done away with, and 2 to 3 army corps staffs will remain at the disposal of the chief command for the purpose of training troops on a declaration of war.

Instead of the former riflemen some entirely new troops will be raised, called Alpine Chasseurs, who take the place of the former riflemen, and a regiment of whom will be raised for each division. These regiments will receive their principal training in the mountains, and the object of their formation is to have some infantry thoroughly trained to mountain warfare. The cavalry brigade remains organised as it is at present. It consists of 2 dragoon regiments and a machine gun troop; each regiment has 3 squadrons.

The field artillery brigade will consist of 2 field artillery regiments, each regiment of 2 brigade divisions, and each brigade division of 3 batteries.

The sapper battalion will be made up of 2 sapper and 1 telegraph pioneer company, and will have a light bridging train. The field hospital consists of from 3 to 6 ambulances, the divisional park of from 2 to 3 park columns, and the park column of from 2 to 4 park companies. The supply column is divided into the supply company (butchers and bakers) and the supply train.

The changes in the training of the Army, as laid down by the new scheme, are most important. Above everything, endeavours will be made to physically prepare youths at school for their future military duties by a preliminary gymnastic instruction of at least 60 hours yearly. All youths from 16 to 20 years of age will go through a further obligatory course for physical development and of musketry training. The carrying out of recruit training in special schools and the training of the cadres lies, as formerly, in the hands of a corps of instruction; the period of training in the recruit schools has been increased, for the infantry, from 45 to 60 days. The same period is laid down for the other branches of the Service, with the exception of the cavalry, whose course of training remains fixed at 80 days. Repetition courses, lasting for 11 days, will be held yearly, instead of biennially as has been hitherto the case. The following have to take part in them:—All officers, the higher non-commissioned officers, the youngest of the remaining non-commissioned officers of the annual contingent, the 8 youngest soldiers of the annual contingent, and all those men who are retained in the Service.

In the Landwehr all branches of the Service, with the exception of the cavalry, will have to go through a repetition course of 11 days. The following, however, will only be ordered to attend:—The officers, the higher non-commissioned officers, and the 3 juniors of the annual contingent of the remaining non-commissioned officers and of the men.

The length of course in the Officers' School for infantry, cavalry, and transport officers is 70 days, for artillery and engineers 105 days, and for medical, administration, and commissariat officers and veterinary surgeons 60 days. Newly appointed lieutenants have to go through a course at a Recruits' School. The further services required from the principal arms are:—For 1st lieutenants of infantry a musketry course of 15 days; for cavalry lieutenants a course in patrol leading of 15 days; for artillery lieutenants and 1st lieutenants a gunnery course of 20 days; and a tactical course of 15 days for artillery 1st lieutenants noted for promotion. There will also be a course of 40 days at one of the I. Central Schools for all 1st lieutenants of the 4 branches of the Service and of the fortress troops, and a course at a Recruits' School for all 1st lieutenants of all the branches of the Service, who are anticipating promotion, for instruction in the position of a unit commander; only captains who aspire to higher promotion are ordered to the II. Central Schools. All subaltern officers, non-commissioned officers and men, drilled to small arms, of the Field Army and the Landwehr must yearly go through a course of musketry under the auspices of one of the shooting societies. Whoever fails to take part in these must go through a special 3 days' musketry course without pay. The training of staff officers is carried out the same as formerly.—*Précis* from the *Internationale Revue über die gesamten Armeen und Flotten* and the *Militär Wochenblatt*.

WAR NOTES.

No events of any very great importance took place during the month of September in Manchuria after the battle of Liao-yang. General Kuropatkin's detailed report of that battle was published in St. Petersburg on the 14th September. It gives a very clear account of the fighting and of the loss of the Sy-Kwan-tien position, which decided him to retreat

on Mukden. General Kuropatkin states that all the equipment of his army was successfully removed, but that all the commissariat reserves were destroyed, as there was no time to remove them. The Russian Army retired in perfect order, and all attempts at pursuit by the Japanese were repulsed. The removal of the Russian artillery, baggage, and transport was apparently effected successfully in the face of immense difficulties. The Russians entrenched themselves at Mukden, and after a rest of about three weeks, which was utilised for completing the railway to the narrow gauge behind them up to Liao-yang, and for bringing up stores and reinforcements, the Japanese again assumed the offensive, and constant skirmishes took place between the outposts of both forces. The completion of the Circum-Baikal railway has increased the facility, to the Russians, for bringing up stores and reinforcements to the front; on the other hand, the Japanese have profited by their command of the Liao river to institute a continuous service of junks with supplies.

The St. Petersburg *Official Messenger* has published the text of an order of the day issued by General Kuropatkin to his troops on the 2nd October, in which he states that the Russian Army in Manchuria is now strong enough to begin a forward movement, and closes with an appeal to the troops to bear in mind the absolute necessity of victory, in order to uphold the dignity and rights of Russia in the Far East and to relieve the Port Arthur garrison. It is reported that the Russians commenced an offensive movement against the Japanese on the following day, and apparently manœuvred them out of their position at Ben-tsia-futse, and continued a general advance against Liao-yang, which has been strongly fortified by the Japanese. The latest reports indicate that irretrievable failure has resulted to the Russian forces from General Kuropatkin's forward movement. The series of battles, consequent on it, commenced on the 9th October along a front of many miles in length, and although fighting is still continuing at the time of going to press, on the 14th October, it is very evident that not only has the Russian advance been checked at every point, but that a counter-attack delivered by Marshal Oyama has been attended with considerable success. The Japanese appear to have gained ground everywhere, and on the 13th October drove back the Russian right and centre, inflicting heavy losses. The Left Army, under General Oku, has captured 25 guns, and captures from the other armies are believed to have considerably augmented that number. According to the latest information the Russians appear to be falling back everywhere; the Japanese Right Army is engaged in a vigorous pursuit of the enemy towards the North, whilst the Centre Army is following up its attacking movement, and expects shortly to be in possession of the railway line near Tung-shan-ku.

One of the most important military events of the past month has been the appointment by the Tsar of General Gripenberg to the Command of a Second Manchurian Army. The constitution of this Army is not yet known, but it will have its base at Harbin. The new commander of that Army is a man of 66 years of age, who has seen service and distinguished himself in the Crimea, the Polish insurrection, Turkistan, and in the Russo-Turkish War, when he commanded the Moscow Guards.

The situation at Port Arthur continues apparently the same, but the Japanese are undoubtedly tightening their grip on the fortress. Various reports come to hand of desperate fighting with varying success. The Japanese, according to their official report, appear to have captured some of the surrounding forts, whilst the Russians claim to have repulsed their repeated and fierce assaults.

NAVAL AND MILITARY CALENDAR.

SEPTEMBER, 1904.

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- 1st (Th.) The main Russian Army was driven out of Liao-yang after 4 days' severe fighting.
 " " The Japanese General, Kuroki, crossed the Taitse-Ho and endeavoured to cut the Russian communications between Liao-yang and Mukden.
- 2nd (F.) The Somaliland Despatches were published in the *London Gazette*.
 4th (S.) Liao-yang was occupied by the Japanese.
- 5th (M.) H.M.S. "Proserpine" left Sheerness for the East Indies.
 " " General Kuropatkin foiled General Kuroki's attempt to cut him off, crossed the Taitse-Ho with the bulk of his army, and retreated towards Mukden.
- 7th (W.) The 13th Hussars left England for India in the "Assaye."
 " " A treaty was signed at Lhasa between Great Britain and Thibet.
- 8th (Th.) H.M.S. "Implacable" paid off at Devonport.
 " " Launch of H.M.S. "Adventure" from Elswick Yard.
- 9th (F.) H.M.S. "Implacable" recommissioned at Devonport for Mediterranean.
- 10th (Sat.) Launch of first-class armoured cruiser "Milwaukee" from the Union Ironworks, San Francisco, for U.S. Navy.
- 13th (T.) H.M.S. "Implacable" left Plymouth for the Mediterranean.
- 15th (Th.) The Japanese recommenced their advance against the Russians at Mukden.
 " " In fighting at Port Arthur, 45 Russian guns were destroyed and the Russian garrison lost 400 killed and 800 wounded.
- 20th (T.) 2nd Bn. Cheshire Regiment left England for India in the "Soudan."
 " " Reported that the Japanese had captured some important forts round Port Arthur.
- 22nd (Th.) H.M.S. "Formidable" arrived at Portsmouth from Mediterranean.
 " " H.M.S. "Pegasus" paid off at Chatham.
- 23rd (F.) H.M.S. "Hermione" paid off at Devonport.
 " " The British Mission left Lhasa, Thibet.
- 25th (S.) The Tsar appointed General Gripenberg to the command of a 2nd Manchurian Army.
 " " The Da-ling was captured by the Japanese.
- 29th (Th.) Launch of first-class battle-ship "Connecticut" from the Brooklyn Navy Yard for U.S. Navy.
 " " H.M.S. "Retribution" paid off at Devonport.
 " " H.M.S. "Prometheus" commissioned at Devonport.
- 30th (F.) H.M.S. "Formidable" paid off at Portsmouth.
 " " H.M.S. "Diana" commissioned at Devonport for Mediterranean.
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Addendum to August Calendar.

- 27th (Sat.) Launch of first-class battle-ship "Louisiana" from the Newport News Shipbuilding Company's Yard for U.S. Navy.
- 31st (W.) H.M.S. "Goliath" paid off at Chatham.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval*. Buenos Aires : August, 1904.—“The Measurement of Electric Waves.” “The Defence of Buenos Aires.” “The Lisbon International Maritime Congress.” “Theoretical Points on the Dioptric and Catoptric System of Projection.” “The Barr and Stroud Range-Finder.” “Expansion of Brazilian Naval Power.” “Armstrong Mountings.” “Some Navy Leagues.” “Foreign Naval Notes.”

AUSTRIA-HUNGARY. — *Mittheilungen aus dem Gebiete des Seewesens*. No. 10. Pola: October, 1904.—“Observations on the Russo-Japanese War” (*continued*). “The Magnetic Sources of Error in Ships’ Compasses.” “Foreign Naval Notes.”

BRAZIL. — *Revista Marítima Brasileira*. Rio de Janeiro: August-September, 1904.—Has not been received.

FRANCE.—*Revue Maritime*. Paris: July, 1904.—“Historical Notes: The Internment of the Duchess of Berry in the Citadel of Blaye (1832-33).” “The *Rôle* of the Navy.” “The Mercantile Marine.”

La Marine Française. Paris: September, 1904. — Has not been received.

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Le Moniteur de la Flotte. Paris: 3rd September, 1904.—“Essential Reforms.” “Travelling and Lodging Allowances.” “M. Pelletan at Toulon.” “The Russo-Japanese War.” 10th September.—“The Importance of Port Arthur.” “The Reporter of the Naval Estimates at the Dockyards.” “The Russo-Japanese War.” 17th September.—“Marseilles and Genoa.” “The Russo-Japanese War.” 24th September.—“Flying Naval Bases.” “The English Submarines at the Manœuvres.” “The Extra-Parliamentary Commission on the Navy.” “The Russo-Japanese War.”

GERMANY.—*Marine Rundschau*. Berlin: August-September, 1904.—“Theory and Practice at the Battle of Trafalgar.” “Lieutenant Dewar's Prize Essay.” “England in Egypt.” “Completion of the Sea and Fog Signalling Arrangements in German Harbours and on the Coasts.” “The Russo-Japanese War.” “Naval Literature in 1903.” “Foreign Naval Notes.”

ITALY. — *Rivista Marittima*. Rome: August-September, 1904. — “Fighting at Close Quarters.” “Telegraph Cables and the Submarine Currents in the Straits of Messina.” “A New Interpretation of the Stability Trials of Ships.” Letter to the Director:—“The Commissariat in the Royal Navy.” “Foreign Naval Notes.”

PORTUGAL. — *Revista Portuguesa, Colonial e Maritima*. Lisbon: September, 1904.—“Progress of Tobacco Cultivation in Cuba” “Some Remarks on the Zambesi.” “African Proverbs.” “The Colonial Movement.” “Foreign Naval Notes.”

SPAIN.—*Revista General de Marina*. Madrid: September, 1904.—“Comparative Study of Organic Naval Laws.” “Report of the Committee Appointed to Carry out Trials with Hadfield Projectiles.” “Submarines in the Extreme East.” “Sound Signals for Coast Service.” “The Progress of the United States Navy.” “Russia and the Dardanelles.” “Shooting of Spies.” “The Russo-Japanese War.” “Uniforms.”

MILITARY.

ARGENTINE REPUBLIC.—*Revista del Boletín Militar del Ministerio de la Guerra*. Buenos Aires: July and August, 1904.—“Statistics.” “Description of the 7.5-cm. 28 calibre Field Gun, 1898 Model.” “Additional Notes on the Telegraphy Course.” “The 3rd Infantry of the Line.” “Mounted Infantry in England.” “The Employment of Wireless Telegraphy in Modern War, and its Present State of Perfection.” “Powder Regulations in the Argentine Republic.” “Distribution of Force: The Effectiveness of the Connecting Links.”

AUSTRIA-HUNGARY.—*Danzer's Armee Zeitung*. Vienna: 1st September, 1904.—“The Attack on the Army, and—Playing at Soldiers.” “The Russo-Japanese War” (*continued*). “Night Security Service at Coast Fortresses.” 8th September.—“Battle Instructions for the Japanese Field and Mountain Artillery.” “The Russo-Japanese War” (*continued*). “Military History at the Historical Congress in Salzburg.” 15th September.—“The Infantry Attack.” “The Russo-Japanese War” (*continued*). “Comments on the Russo-Japanese War.” 22nd September.—“The Russo-Japanese War” (*continued*). “Russian Opinion on the Situation at the Theatre of War.” “Our Manœuvre Machine Gun Detachments.” “Rations in Peace Time.” 29th September.—“Lettow-Vorbeck's '1815.'” “The Russo-Japanese War” (*continued*). “How can the Field Artillery Profit by our Machine Gun Detachments?”

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: September, 1904.—Has not been received.

Organ der Militär-wissenschaftlichen Vereine. Vienna. Völ. LXIX. Part 1. 1904.—"The Second Part of the Franco-German War, 1870-71." "Outpost Studies" (continued).

BELGIUM.—*Bulletin de la Presse et de la Bibliographie Militaires.* Brussels: 31st August, 1904.—"Artillery on the German Footing—Siege, Position, and Heavy Army Artillery" (continued). "The English Provisional Regulations for the Drill and Instruction of Cavalry" (continued).

15th September, 1904.—"The Two Years' Period of Service in France." "Artillery on the German Footing—Siege, Position, and Heavy Army Artillery" (continued). "The English Provisional Regulations for the Drill and Instruction of Cavalry" (continued). 30th September.—"The Two Years' Period of Service in France" (concluded). "Artillery on the German Footing—Siege, Position, and Heavy Army Artillery." "The English Provisional Regulations for the Drill and Instruction of Cavalry" (continued).

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September, 1904.—Has not been received.

Revue du Génie Militaire. Paris: August, 1904.—"Heating by Steam at Low Pressure." "Matériel of the German and Austrian Cavalry Bridges."

September, 1904.—Has not been received.

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Revue du Service de l'Intendance Militaire. Paris: September, 1904.—"The Reorganisation, Administration, and Budget of the English Army" (concluded). "Discussion on the Investigation regarding the Storage of Preserved Meat." "An Army Administration of the 18th

Century" (*continued*). "Algerian Oats Harvested in the Midlands of France." "Millon's Works on Wheat" (*continued*).

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Neue Militärische Blätter. Berlin : July, 1904. No. 1.—"Infantry Fire at Long Ranges." "The Military Importance of Railways." "The Recruiting of Officers, their Method of Life, their Luxury, and Ill-treatment in the Time of Frederick the Great." No. 2.—"Infantry Fire at Long Ranges" (concluded). "New Training for Mounted Orderlies." "Military Echoes." "Military Intelligence." No. 3.—"Education of Japanese Naval Officers." "The Russo-Japanese War." "Asiatic Tactics." "Military Echoes." "Military Intelligence." Nos. 4 and 5.—"The Crossing of the Rhine by the Silesian Army, under Field-Marshal Blücher, on New Year's Night, 1844." "The Russo-Japanese War" (continued). "On the Cavalry Question." "The Advance of the Port Arthur Squadron." "The Chief Maritime Powers in Eastern Asia." "The Motor Volunteer Corps." "Home-sickness in Horses." "Military Echoes." "Military Intelligence."

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Jahrbücher für die Deutsche Armee und Marine. Berlin : September, 1904.—"On Continuity in Military Education and Training." "Infantry Methods of Combat." "Statistics regarding the IInd French Army Corps on the 6th and 16th August, 1870." "Principles for the Prevention of Sickness in the Army." "Russia and the Russo-Japanese War." "Frederick the Great's Principal Fighting Generals." "The Japanese Field Gun."

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Revista de Infanteria. Lisbon: September, 1904.—"Rifle Ranges" (continued). "The Literary Instruction of the Soldier." "Military Equipment." "Military Communications." "A New Equipment." "The Necessity of Reform in the Disciplinary Regulations." "Pay and Pensions." "War and Hypnotism."

RUSSIA.—*Voïennyi Sbornik.* St. Petersburg: July, 1904.—"Prince Eugene-Napoleon Beauharnais at the Head of the Grand Army" (continued). "The Battle of Inkerman and the Defence of Sebastopol" (concluded). "From Zaravchau to Tachkepri" (continued). "From Khaitchen to Mukden" (concluded). "The Japanese Field Service Regulations" (concluded). "Modern Ideas in the Cavalry" (concluded). "Influence of the Flatness of the Trajectory of Q.F. Guns on the Operations of Troops in the Offensive and the Defensive" (concluded). "Object of Coast Fortresses" (concluded). "Sugar as a Food for Horses." "On the Frontier of Afghanistan" (continued). "The War with Japan." "Development of Duality in the Austro-Hungarian Army." "New Experiments of Militarism in China" (continued).

SPAIN.—*Memorial de Ingeniëros del Ejército.* Madrid: September, 1904.—Has not been received.

Revista Técnica de Infanteria y Caballeria. Madrid: 1st August, 1904.—"Oman's History of the Peninsular War." "Military Service: The Recruit." "Patriotic Mission of the Modern Army." "The Russian Officers' Corps." "Cavalry and the War of 1870." "High Commands and Doctrine in the French Cavalry" (continued). "Passive Military Rights" (continued). 15th August.—"The Military Service; The Necessity of General and Compulsory Service." "Improvised Guards: Generals by Profession." "Points in the History of Spanish Military Pedagogy." "Passive Military Rights" (continued). "A Book to be Recommended."

Revista Científico-Militar y Biblioteca Militar. Barcelona: August, 1904.—"Disciplinary Punishments in the Army." "The Pyrenean Battalions." "Some Considerations on the Organisation of the Portuguese Army" (continued). "The Japanese Artillery." "The Bakevitch Apparatus." 25th August.—"On Horse Racing." "Some Considerations on the Organisation of the Portuguese Army" (continued). "Musketry Instruction in the German Army." "The Japanese Army." "German Moving Targets."

SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: September, 1904.—"Draft Scheme of a Swiss Military Organisation" (continued). "The

Fight Between Infantry and Machine Guns." "The Lukmanier Manœuvres." "The Military Reform at the Zoug Meeting."

UNITED STATES.—*The Journal of the Military Service Institution*. Governor's Island, New York Harbour: September-October, 1904. — "Russo-Japanese War—Financial Preparation of Japan." "The Era of Ironclad Warfare." "Value to Sea Coast Forts of the Land Defence." "Introductory Remarks upon the New Tactics." "Improvement of the Subsistence Service in the Great Armies." "Our New Firing Regulations—Sighting Drills." "Retrospect and Prospect of War." "Military Freehand Sketching." "National Organisation of the Militia." "Relation of the Government to a Patent granted one in its Service." "Training of the Non-Commissioned Officer." "Historical Miscellany." "Translations and Reprints." "Comment and Criticism."

The United Service. New York: September, 1904.—"The Strategy and Tactics of the Russo-Japanese War." "Our Greenland Neighbours." "Hope." "Japan's Aspirations and Internationalism." "Field-Marshal Suvaroff." "Our Contemporaries." "Editorial Notes." "Service Salad." "Paul Morton, Secretary of the Navy."

NOTICES OF BOOKS.

War and Neutrality in the Far East. By the Rev. T. J. LAWRENCE, LL.D., Professor of International Law at the Royal Naval College, Greenwich. 8vo. 2nd Edition. (London: Macmillan & Co. 1904.) 3s. 6d.

That Dr. Lawrence should have found it necessary to publish a second edition of his work on "War and Neutrality in the Far East" within three months of the first appearance of the book is a flattering testimony to its value. It appears also at a most opportune time, in view of the fact that no satisfactory arrangement has yet been arrived at in regard to the several important questions affecting the rights of neutral Powers, on which the United States and this country find themselves at variance with the views of the Russian Government.

In his opening chapter the author gives a concise and clear sketch of the causes which have led up to the present war between the two belligerent Powers. He then deals with the actual outbreak of hostilities and the charges of treachery levelled at the Japanese, not only by the Russians, but by many of the Continental papers. He shows how utterly without foundation these charges are, as nearly every war during the last two centuries has been commenced without any formal declaration; Russia herself has done so on at least seven different occasions. So far from Japan being guilty of a violation of International Law, Dr. Lawrence holds that she went further than she need have done by giving her adversary ample notice of what he might expect. As a matter of fact, on the admission of many of her own officers, Russia was not taken unawares. Dealing with the question of the rescue of the crews of the "Varyag" and "Koreetz" after the action off Chemulpo, the author considers that the incident shows, among other things, that provision will have to be made in future for assistance by neutral ships of war, as well as by neutral hospital-ships and ordinary neutral vessels. He gives it as his opinion that men so rescued should either be interned by the neutral

State effecting the rescue for the rest of the war, or, if returned to their own friends, it should only be under the condition that they shall not serve again while hostilities continue. In regard to the protest made by the English, French, and Italian captains against any attack by the Japanese admiral on the Russian ships while in Korean waters, on the ground that such attack would be a violation of neutrality, Dr. Lawrence thinks that there was no ground for the protest, and that it was not justifiable.

The author touches on the question of wireless telegraphy and its use by the *The Times* correspondent on board the "Haimun," and he holds strongly the view that an International Conference will have to devise regulations, and that power should be given by International Convention to exclude the vessels of correspondents from any zone of sea in which important warlike operations were in process of development. In the same chapter he discusses at some length the question with regard to the use of marine mines.

Another interesting chapter is the one devoted to the action of the Russians in the Red Sea, and the use of neutral waters by belligerents. The author is quite clear that Rear-Admiral Wirenius greatly exceeded his rights, and that he violated the neutrality of Egypt in a gross and open manner, although it was his duty, under all recognised rules of International Law, to respect the regulations which had been laid down by the Egyptian Government as a neutral one. In this connection, Dr. Lawrence asks whether the time has not come, in order to protect the neutrality of the Suez Canal, that the Gulf of Suez, which is a natural prolongation of the canal, should not also be neutralised by International agreement, as, although the entrances to the canal cannot, under existing Conventions, be blockaded, yet at present for practical purposes this rule can be set completely at naught, as far as the eastern end is concerned by a belligerent cruising in the narrow waters of the gulf, as, in fact, was done by the Russian admiral. The Convention of 1888 was observed with absolute exactness, yet the neutralisation of the canal vanished. The situation therefore deserves the careful consideration of the maritime Powers.

Under the heading of "Contraband of War," Dr. Lawrence deals with the thorny question of coal and food supplies, but he contents himself rather by a general survey of his subject, in preference to definitely laying down the law, leaving his readers to draw their own conclusions; and the same may be said as to the chapter devoted to the duties of neutrals. Although admitting that possibly a compromise was necessary in the case of the "Malacca," he yet regrets it, as the fresh examination of the ship was "contrary to the fundamental principle for which we contended. He deals at some length with the cases of the "Allanton," "Knight Commander," and "Hipsang," and expresses a doubt whether the nation understands the vast importance of the questions which have been opened up by the present war. The cumulative effect of all the Russian pretensions taken together has not as yet been realised, and unless they are withdrawn or curbed, other maritime nations will put forth similar claims, and we, as the greatest of the trading peoples, shall be the chief sufferers, whether we happen to be a belligerent or neutral. In Dr. Lawrence's own words:—"Not only is our own security menaced, but the welfare of the civilised world also. Instead of advance, we see everywhere retrogression—days of grace shortened, the right of search used to the fullest extent without regard for the interests and susceptibili-

ties of neutrals, no immunity granted to mail steamers, the Law of Contraband so extended that nearly all trade with the enemy is brought within it, and that at a time when the blockade of one of the least of his ports is utterly out of the question, the penalties on neutral vessels engaged in forbidden acts arbitrarily increased, till few can feel secure against destruction at sea without trial and without redress, neutral sovereignty flouted wherever it can be done with impunity, protests disregarded, concessions evaded, and pledges broken."

A study of this little book is to be cordially recommended, as it will enable every reader to see for himself what is the state of International Law on many of the vexed problems which have cropped up.

PRINCIPAL ADDITIONS TO LIBRARY DURING SEPTEMBER, 1904.

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Japanese Grammar Self-Taught. By H. J. WEINTZ. Crown 8vo. 5s. (Presented.) (E. Marlborough & Co.) London, 1904.

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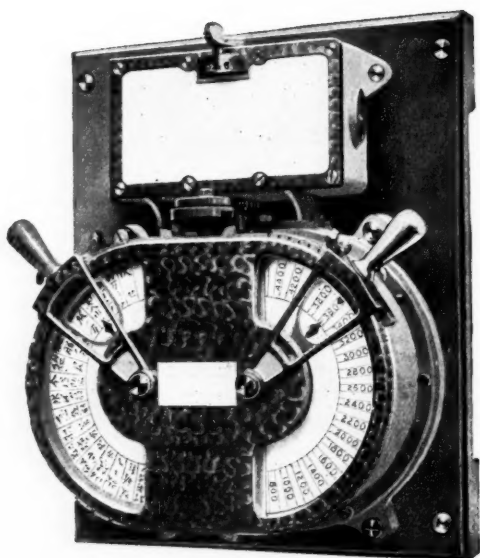
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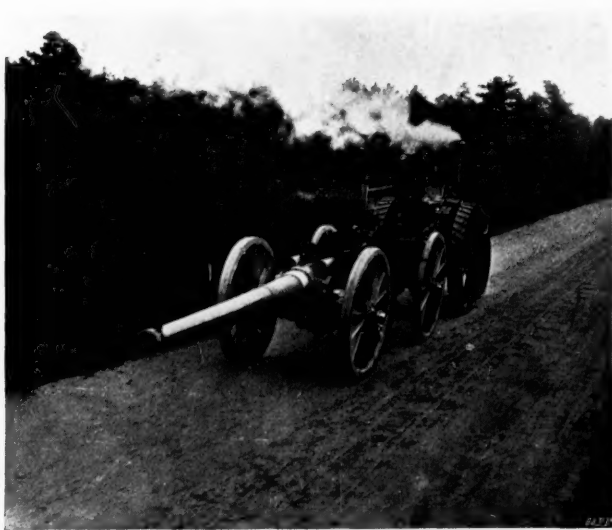
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LECTURE NOTICE: POSTPONEMENT.

Owing to a severe accident to Colonel Gourand, the Lecture which was to have been delivered by him "On the 1st Regiment of Vol. Cavalry, U.S.A., in the War of Secession, 1861-1865" on Tuesday, November 22nd, is unavoidably postponed. The future date of delivery will be duly announced.

ERRATUM IN OCTOBER JOURNAL.

Naval Notes, page 1186, line 18: for "Custanee" read
"Eustace."